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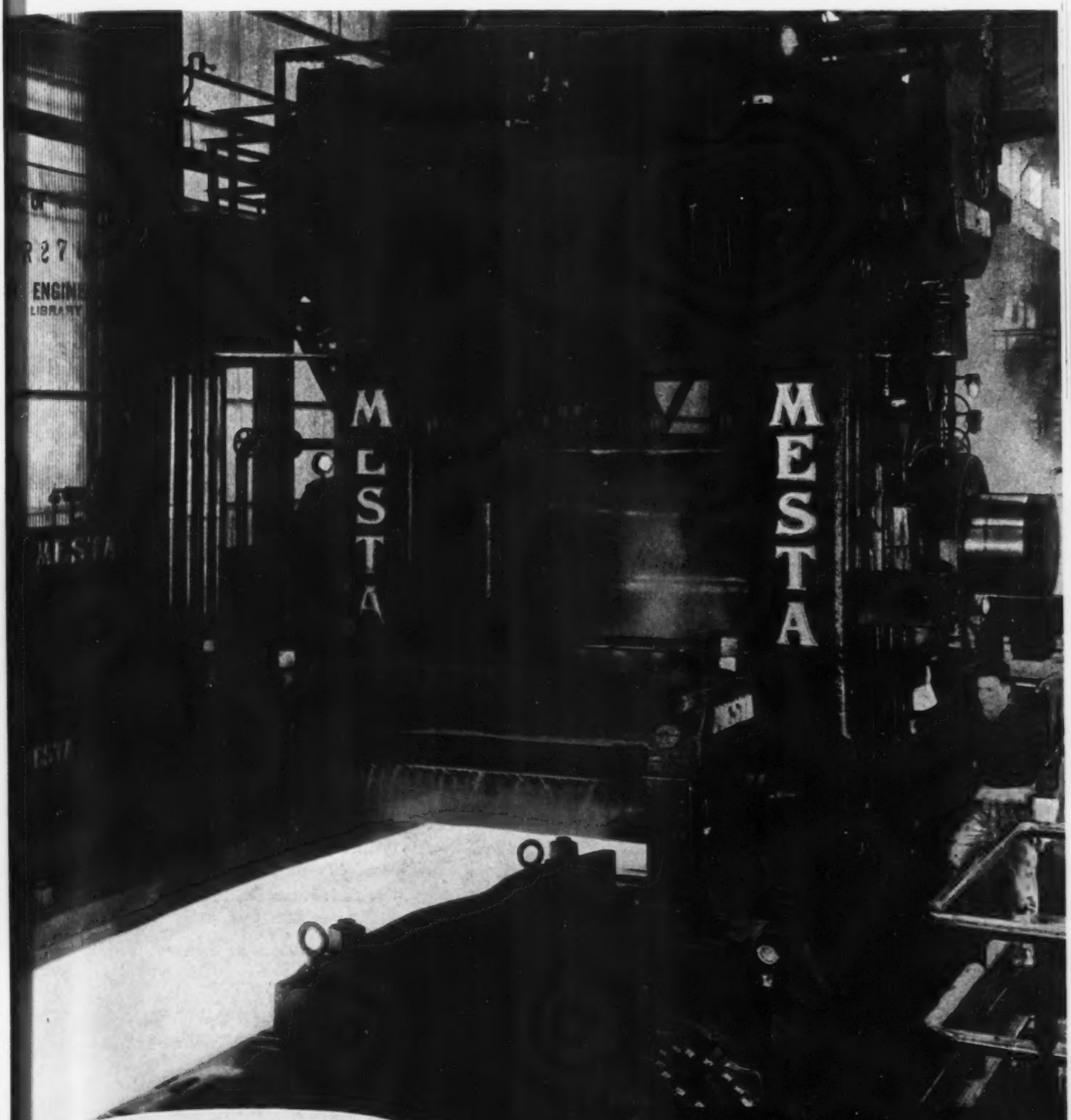
THE IRON AGE

THE NATIONAL METALWORKING WEEKLY April 27, 1950



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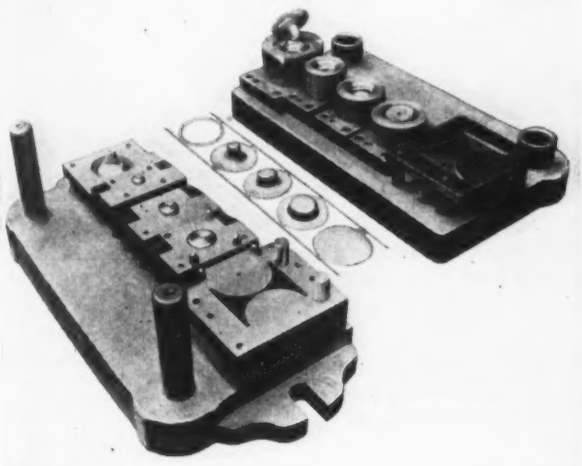
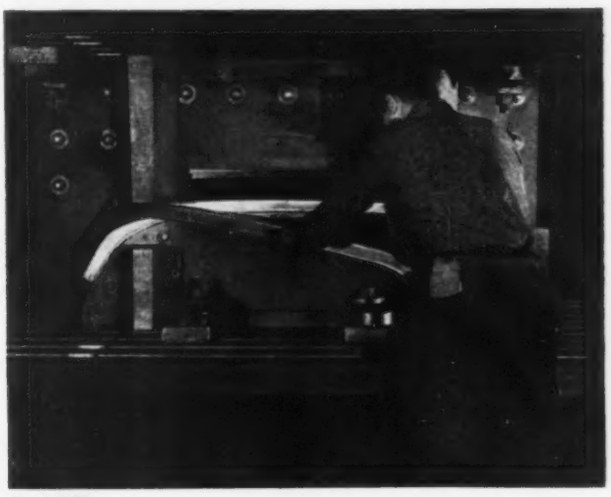
BTR the versatile oil-hardening grade, is ideal for cold-working dies such as this one which forms wheel housings. It is easy to machine and heat-treat.

67 Chisel used in the punch of this die which forms 0.185-in. sheet steel, has maximum impact properties for shock tools and master hobs.



Lehigh H the high-carbon, high-chrome grade for maximum production, greatly increased the output of this progressive die for drawing and blanking.



A-H5 (5 pct chrome air-hardening) holds a durable cutting edge, has high resistance to distortion. This die trims a ragged edge from steel parts.

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THE IRON AGE

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APRIL 27, 1950 • • • VOL. 165, NO. 17

Special Report

The United States lags behind foreign nations in its handling of depreciation of industrial plant and equipment. Current tax regulations make it difficult to get money to replace obsolete or worn out equipment. Many companies have a hit or miss approach to the problem of obsolescence. Congress is not likely to act soon on the problem unless industry makes its needs felt more strongly.—p. 79.

Issue Highlights

Manufacturing quality can be set at any desired level through use of simple statistical methods. The control system in operation at Willys-Overland maintains desired quality levels with a minimum of inspection costs.—p. 91.

Large parts may be inspected nondestructively, and mixed lots of metals separated, through use of a newly developed test head on the GE Metals Comparator. The device is used for close control of composition, heat treatment, hardness, case depth, and plating thickness.—p. 95.

High temperature alloys are now in competition with heat and corrosion resistant stainless steels for the world's limited supply of columbium. This alloying agent, which has acquired strategic importance, is now being allocated in the form of ferrocolumbium.—p. 101.

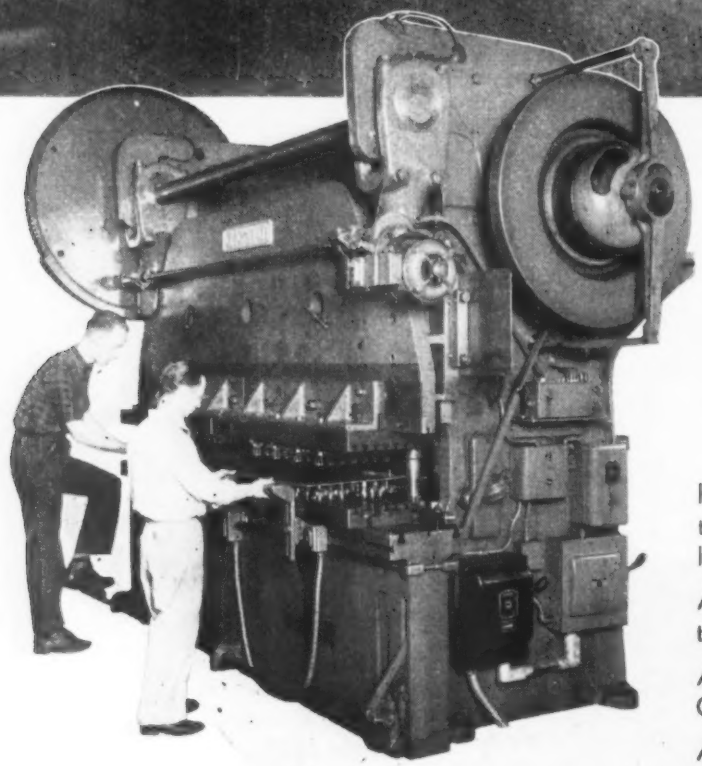
The congressional probe of the steel industry had broadened out this week to include an investigation of fabricating activities by major steel producers. Officials of U. S. Steel were preparing to answer complaints that "encroachment" of steel producers was creating a lack of competition.—p. 103.

The shift from hot dip to electrolytic tinplate production was never more evident than now. Two producers have announced plans to build new electrolytic lines, while a third has taken the wraps off the biggest and fastest line in the industry.—p. 106.

Coming Next Week

The Foundry Show at Cleveland is the theme of next week's IRON AGE Special Issue. The latest developments in the foundry industry are covered, including: (1) The activities and results to date of the Foundry Educational Foundation in bringing together the foundry industry and the schools of the country; (2) a new electronic method for drying cores; and (3) the latest specifications for ductile iron.

Indexed in the Industrial Arts Index and the Engineering Index. Published every Thursday by the *CHILTON CO. (INC.)*, Chestnut and 56th Sts., Philadelphia 39, Pa. Entered as second class matter Nov. 8, 1932, at the Post Office at Philadelphia under act of March 3, 1879. $8 yearly in United States, its territories and Canada; other Western Hemisphere Countries $15; other Foreign Countries $25 per year. Single Copies 35¢. Annual Review Number, $2.00.



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Editorial

INDUSTRY VIEWPOINTS

Big...Little? Big...Little? Big...Little?

THE congressman was in a happy mood. He was well relaxed. And why not, his steel inquisition was coming along pretty good. And what's more he was looking for the people to elect him again.

But something else was making him feel good. He had an idea that maybe everything that was big ought to be little.

"Jack," he said to his pal, "why don't we issue a general order at once making everything big, little. I'm not so sure that all big things are bad. Not quite sure but heck you know how things are."

Jack missed the point but like all good Jacks he said, "Sure, boss. What's the pitch? What you got in mind?"

"Well I'm not sure but I know some big things that are bad and something ought to be done about it. What do you think is the biggest thing we can do to make things little?" said the congressman as he tried to relax again.

"Well boss, I think the biggest thing we can do to make things smaller is to start with big steam shovels. Don't you?"

"Whadya mean Jack? We can't do that . . . or yes maybe we can."

"Do you like it boss?"

"Well as I see it we ought to issue an order and have the Justice Dept. issue an order and then have the FTC issue an order that hereafter all real big steam shovels should be replaced with teaspoons. In that way we will have competition, increase the working force, raise wages. . ."

"Yeh, I know boss but how big should the big steam shovels be before we replace them with teaspoons? We gotta have a line somewhere," says Jack.

"That's easy, Jack. Just take some of those big steam shovels that are doing a good job and replace them with about a trillion teaspoons. Then for some of the smaller big shovels we can use tablespoons."

"I know, boss, but you can't do that because, heck, you know that the small big steam shovels will then be the biggest ones because the tablespoon guys will be bigger than the teaspoon guys."

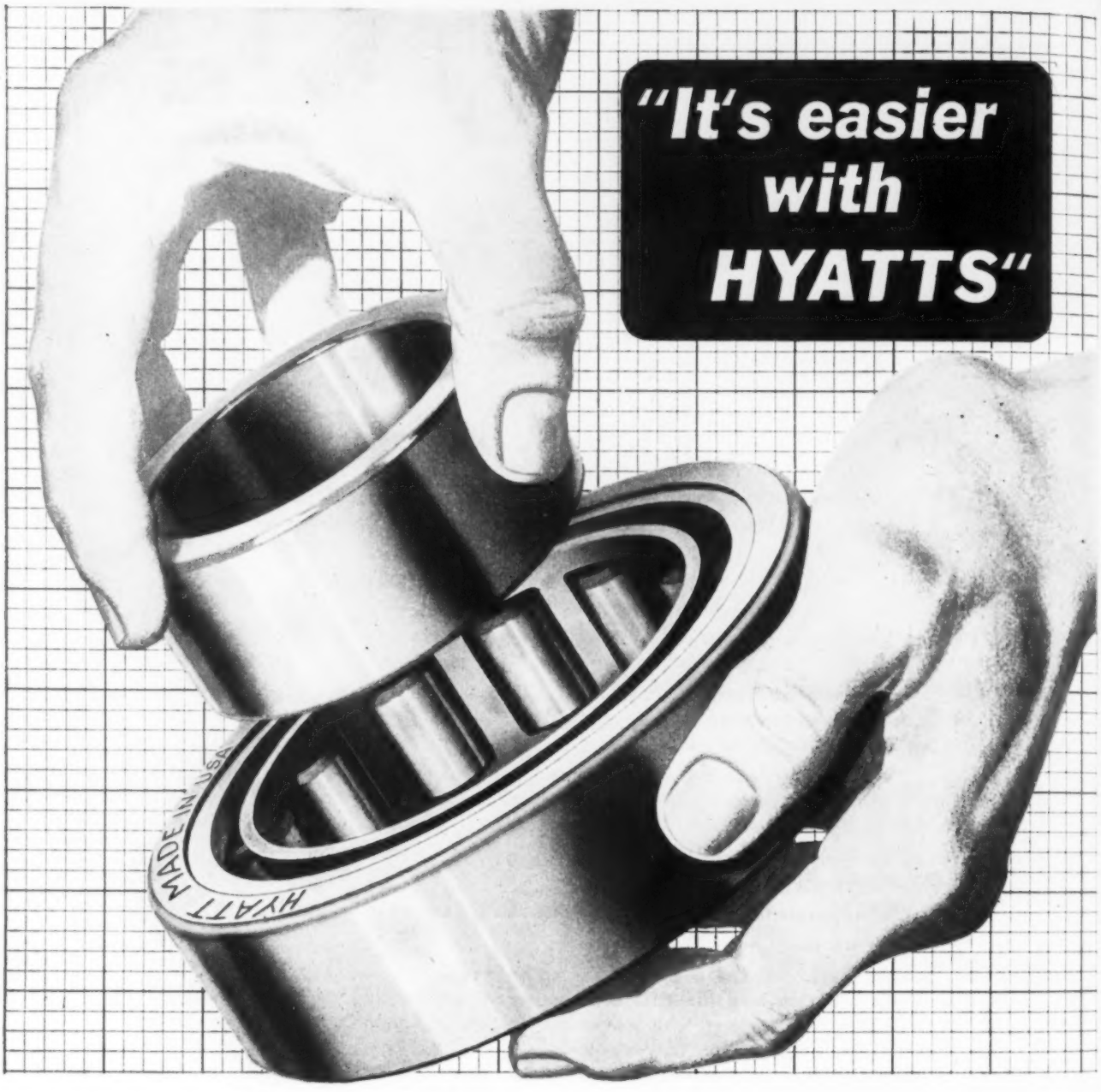
"Jack, we'll work that out."

"Say boss, where will we get the spoons? It will take a lotta big companies to make them."

"Let's issue the order, I'm confused," said the boss as he nodded off to sleep.

Tom C. Campbell

Editor



BY VIRTUE of their interchangeable parts—as this photograph of a Hyatt Hy-Load Roller Bearing shows—we make it easier for the machine builder to install Hyatts without selective fitting.

But ease of assembly and disassembly is only part of the story. Add to this easier machine operation, design simplification and longer life with Hyatts and there's your answer to why they are universally preferred.

That's why it pays to design Hyatts into the machines you build or to look for Hyatts in the specifications of equipment you purchase. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

NEWSFRONT

NEWS, METHODS AND PRODUCT FORECAST

► Present airfield runways are not expected to stand up under repeated landings of the newest heavy bombers. The answer may be prestressed concrete runway slabs which would be faster to build and cost less than the very deep concrete construction that would otherwise be required to resist landing shocks. A single runway is expected to require several thousand tons of prestressing steel wire or cable in addition to some reinforcing steel bars.

► The Pennsylvania R. R., which now builds its freight cars in its own shops is currently inquiring for 5000 gondolas and 5000 box cars. The size of the inquiry is encouraging to the independent freight car builders even though it may only be designed to see where it would be cheaper to build the cars. Some 210,000 tons of steel would be needed to fill such an order.

► A new plate type heat transfer coil is now in competition with the conventional pipe coil for industrial use. Embossed sheets of cold-rolled or stainless steel are seam and spot welded to fabricate the unit—as in refrigerators. Idea is to adapt it for u ` in electroplating tanks and large storage tanks in the petroleum and chemical industries.

► The automobile marketing experts are still talking down the pessimists with this undisputed fact: There are nearly 14 million passenger cars in the U. S. today that are 10 or more years old. Before the war there were only 5 million in that age bracket.

► The steelworkers union is making U. S. Steel its target for technological changes just as it does for pay and pensions. The company is now trying to find a new ingot mold coating to replace tar, to which the union objects because of fumes. Other steel companies are interested too, knowing they'll be next. Deadline for the changeover is now set by the union at July 1.

► A motorcycle manufacturer is quietly developing designs and tooling with the idea of introducing an automatic transmission on its 1951 models.

► Because of the revenue from byproducts, at least one of the well known new high priced antibiotic drugs costs practically nothing to make. Another great new chemical sells at wholesale for almost twice the manufacturers cost.

All of which is enough to make steel company public relations men wonder why a $4.00 a ton steel price boost brings about two Congressional investigations at a cost to steel companies that runs into six figures.

► Despite the higher prices of today's motor cars it took only 954 man-hr to build a 1948 model against 2763 man-hr for a 1914 model.

► The Dept. of Defense sees good commercial possibilities in a new series of synthetic resin plastics. The group is non-corrosive to metals, shrinks negligibly on setting and is affected only slightly by 30 pct sulfuric acid or sodium hydroxide. It was developed at Princeton for the armed forces.

Steelmaking Records Smashed

Consumers Putting On Pressure

Scrap Prices Score New High

The Iron Age SUMMARY

IRON AND STEEL INDUSTRY TRENDS

STEEL production is knocking all former records into a cocked hat this week. Ingot operations are scheduled at 100.5 pct of rated capacity. If this rate is maintained steel output for the week will be more than 1,912,000 tons. This is more steel than the industry has ever before been able to turn out in a single week — in peace or war. Barring unforeseen trouble, operations are expected to remain very near the 100 pct mark for the next several weeks.

Record breaking steel production—and the anticipation that it will continue—is also pumping more steam into the scrap market. Once again THE IRON AGE steel scrap composite price has set a new high for the year. Scrap price advances are healthy and widespread. Although cast grades scored the biggest gains last week, steelmaking grades are leading the parade this week.

This week even the timid and the conservative admit that the steel market is booming. But even the bold and the optimistic cannot say how long it will last. Steel demand is growing stronger and supplies are growing tighter. Manufacturers are reaching for steel with one hand and aspirin with the other.

Manufacturers Boosting Output

Conversion deals are snowballing. Some of them now extend as far ahead as August. Only a few weeks ago most people thought they would end in the second quarter. The freight car builders are finding it tough to get steel for the recent influx of orders handed them by the railroads. Their pickup in business just happened to come at the wrong time. Although they have been able to step up production somewhat, they will really have to go some to equal their estimate of 40,000 to 50,000 cars this year.

Other manufacturers are also boosting their output. Auto makers and appliance people have their plants humming record tunes. Some appliances and farm implements are being turned out faster than they are being sold. This could become significant later this year. The auto market is holding up surprisingly well. This could be Detroit's best year.

But there are a few inequalities which could develop into trouble spots within a few months. Some of the largest and most aggressive steel users are procuring their supplies of steel faster than they are using them. Obviously they are trying to restore their inventories to the desired level. When that has been accomplished they will need less tonnage—if their sales drop they will need much less.

Cost Factor Checks Market

THERE is enough pressure on the steel market to make it go haywire if it were not for the steadying influence of costs. Some consumers are paying $30 to $40 a ton above the market price (premium prices) for tonnage from marginal mills. Others are paying as much as $50 to $60 a ton extra for conversion steel. But their costs are such that they will not pay the fees necessary to support a thriving gray market. In a market so tight, curbstone brokers are conspicuous by their absence.

Ford and General Motors are going all out in a bid for strikebound Chrysler's business. Meanwhile Chrysler has been taking its regular mill allotments, but has been releasing some of its conversion tonnage during the past month. None of this has gone begging. Although rumors and predictions have the strike end near, anything can happen when two wildcats, each with a sore paw, are locked in the same cage.

Small Summer Slump Seen

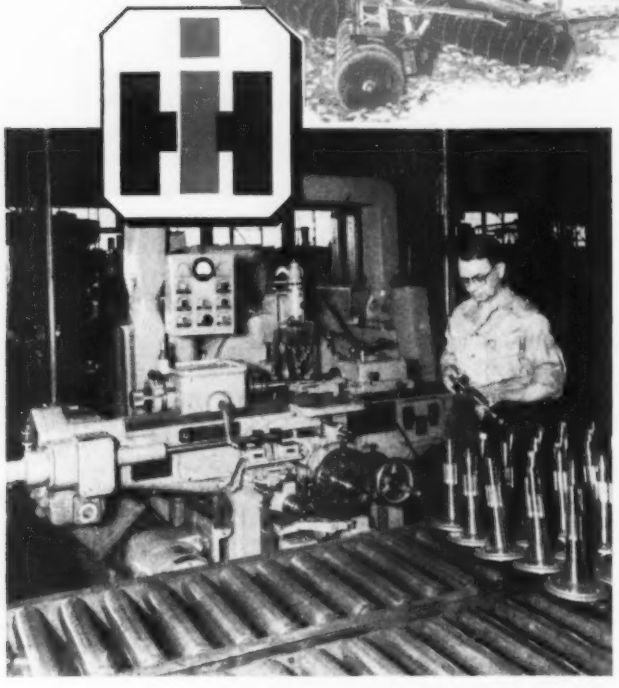
During summer months steel production usually declines as a result of hot weather and vacations. But the decline will probably be smaller than usual this year. For one thing, modernization of steel plants has improved working conditions so that worker efficiency can be kept high during the hot months. Also, pressure from consumers for delivery is expected to influence steelmakers to keep operations high at all costs.

Your keenest competitor knows

That no matter how well established his business may be, *nothing can damage it more than better equipment and better methods in the hands of an aggressive rival!*

He also knows that unless YOUR equipment and methods are "up-to-the-minute", YOU cannot continue to sell YOUR products at competitive prices.

Photos Courtesy International Harvester Company



Take the *INTERNATIONAL HARVESTER COMPANY*, Chicago, Ill., whose competitive efficiency is strengthened by top-flight machine tools and methods. Their Louisville, Ky., plant turns out more than 400 tractors per day—and practically all the threads are GROUND FROM THE SOLID . . . on just TWO Jones & Lamson 6x15 Thread Grinders.

Look at their advantages in threading!

HARVESTER'S threads are ground at a high production rate . . . they are finished in one pass, using a multi-rib grinding wheel . . . heat treat distortion is avoided (grinding is a final operation) . . . no trouble from material variations . . . accurate threads at assembly (size control is automatic) . . . PLUS additional *HIDDEN SAVINGS* based on trouble-free, year-in, year-out machine performance!

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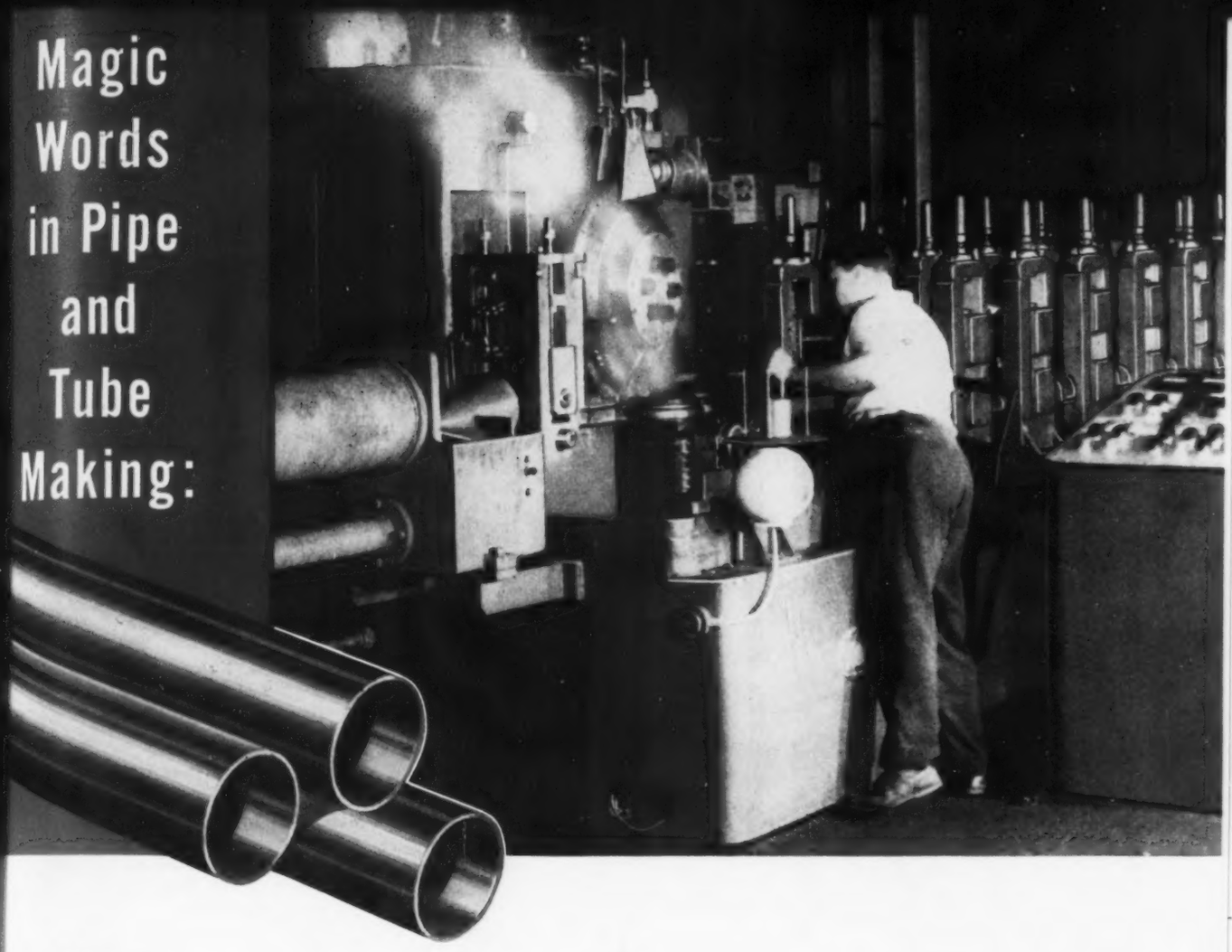

"Speed with Dependability"

OF COURSE, a pipe and tube mill must have many other qualities, such as accurate or easy control; low power, labor, and maintenance cost; accurate forming and sizing, etc.; but, above all, the things upon which the ultimate choice of a resistance-weld tube mill should hinge are the speed and dependability of the Welder.

On the welder, first, last and all the time depends quality and quantity of output as well as unit cost. There's where indifferent design and construction will show up—in welding difficulties, frequent interruptions, repairs and breakdowns.

The independent investigator, bent on getting down to fundamentals, invariably ends up by ascribing the outstanding production of Yoder tube mills to welder superiority—steady, continuous, trouble-free performance, which in the end means high production and low cost.

After such an investigation, the reason for the overwhelming world-wide preference for Yoder mills becomes obvious. There are, as a result, more Yoder mills made, sold and in use than of all other electric-weld mills combined.

Literature, Recommendations, Estimates for the asking.

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- ★ **PIPE and TUBE MILLS–cold forming and welding**

ENGINEERING YODER MANUFACTURING

Fatigue Cracks

By Charles T. Post

Suspicious

Our Western investigator, Bob Reinhardt, reports by secret code that Russia, N. M., is only about 10 miles east of Alamogordo, N. M., which everyone knows is where we make the pottery for our flying saucers.

Termites

Tom Campbell's editorial "Termites at Work" (Apr. 20) bore the stamp of a man who knows what he's talking about. Here, we said to ourselves, is a real researcher whose study of termites in their relation to society will rank him with Maeterlink and the ant. And the drawing of a parallel between the termites and the Communists certainly had a Maeterlinkian touch.

Only yesterday we found out that Editor Campbell knew only too well what he was talking about. He'd just paid a whopping bill to repair the damage done by termites to the foundations of his 150-year-old home.

Audubon's Retort

We'd always expected a counter-offensive in the cold war of the metal industry v. the birds, and now it's come.

P. E. Thompson, a San Francisco resident, has a galvanized steel chimney. With the unfailing regularity of the swallows at Capistrano, a woodpecker clamps onto the chimney every night at 2 a.m. and sounds a premature reveille, waking the whole family. Woodpeckers are protected under the state game laws, so the police can't do a thing about it. Succinctly, the bird is causing a peck of trouble.

No News

Headline in your f.f.j. last week:

MINERS LEAVE DEPRESSED AREAS

With John L. Lewis on the job, you can't expect them to stay in the pits indefinitely.

Puzzlers

Probably from sheer nostalgia, H. Kelsea Moore takes us back to the days of Mr. Whaley's algebra class. Do you remember this one?

"A courier is in the rear rank of a moving column 1 mile long. He leaves his position to deliver a message to his commanding officer in the front rank and returns to his position in the rear. By this time, the column has moved 1 mile. How far did the courier walk?"

The nation's wisdom is well scattered, judging by the answers coming in to solve the quandary of the three wise men with red spots on their foreheads. So far we've heard from K. A. Cruise of Kansas City, Edward H. Andrews of Houston, Felix W. Katz of Pittsburgh, and Simon Grubman of Canton. How now, New England?

Lack of space has previously prevented passing along the news that W. Bobbs of Toronto concocted the correct formula for the 12-coin problem, and R. L. Keller of Niagara Falls spotted the fallacy in the race track tricker. And, incidentally, J. W. Foster, who set the price of eggs on his own puzzler much lower than those who sent in answers, has satisfactorily resolved the discrepancy. It was simply a matter of wording.

(Partial view of the enormous new lubricating oil plant at Lake Charles, La., where this great new oil is processed.)

"ANTI-FOULING" OIL made by the Remarkable new "HEART-CUT" PROCESS

This new oil—the best known to science... gives you a cleaner engine...more economy ...minimum carbon residue.

It's here now! The remarkable motor oil from the giant new $42,000,000 lubricating oil plant at Lake Charles, La. The plant that's been the big talk of the oil industry for months.

New Premium Koolmotor is made by the unique "Heart-Cut" Process which retains only the choicest part of the finest crudes. *It's so superior that in recent engine tests it outscored nine other major premium motor oils.* No wonder Premium Koolmotor is better in every way! Cleans better, seals better, cools better and fights acid, sludge and corrosion far more effectively. Switch to this remarkable new oil today.

start saving Dollars today...stop at

CITIES SERVICE

Dear Editor

Letters from Readers

Profit Sharing

Sir:

Just reading "Profit Sharing Pays" in the March 23 issue of THE IRON AGE, with which I thoroughly agree. At Canadian Line Materials we have been using profit sharing for well onto 12 years now, and we can prove that it has put us into the competitive market where our shipping room door costs are lower than that of any of our competitors. Perhaps it takes a little time to calculate and administrate the plan, but it is well worth the time and effort.

To tie in with our profit sharing we have what we call quills, which means that if an employee is late, absent or spoils work, a percentage of profit sharing is taken from him, and his name is posted on the board, whereas those who do not have any quills during a month have their names show on an honour list. Profit sharing at Canadian Line Materials pays every three months.

L. E. MESSINGER
President
Canadian Line Materials
Toronto 13, Canada

Chemical Borings

Sir:

I want to ask the price of iron which is used chemically for the reduction of nitrobenzene to aniline and similar processes in the preparation of dye intermediates. I belive cast iron turnings, borings, etc. reduced to a fine form are used.

E. W. SHARD

The iron scrap product for the preparation of aniline dies is quoted on in several of our scrap markets as "Clean Cast Chemical Borings." The present price in the Philadelphia market is $28 to $29 per gross ton delivered to consumers.—Ed.

Marforming

Sir:

We read with considerable interest your article in the Feb. 23 issue on the Marform process for using rubber in fabricating thin sheet metal parts. We have used rubber pads for forming small metal parts in a 150-ton hydraulic press which we have in our Experimental Shop. Our main concern is with the strength of the retaining ring for the rubber pad.

We have occasion to make up full-size sample parts for our electric range and refrigerator development projects. In the past we have made these by hand in sections and then brazed or welded the pieces together. We would like to obtain more detailed information regarding the Marform process. What are Martin's Marform metal forming units? What is the largest size they can handle?

W. J. ETTINGER
Assistant General Manager
Hotpoint, Inc.
Chicago

Your inquiry has been forwarded to Hydropress, Inc., who can supply complete details on the process and equipment.—Ed.

Venezuela Report

Sir:

I wonder if it would be possible for me to get one or two clippings—one on Metal Extrusion printed in your issue of August 4, 1949, and since reissued in pamphlet form by the Shell Committee of the Ordnance Assn. The second one is a very excellent report by Tom Campbell on the Venezuelan development. I was in Venezuela about the same time that he was and I must comment that his report is one of the most complete, and would be a helpful adjunct to my own comments on this trip.

E. P. BLANCHARD
Director of Sales
The Bullard Co.
Bridgeport

S.A. Cablegram

WE ARE VERY GRATEFUL FOR THE COPIES OF YOUR EDITORIAL AND WONDERFUL STORY ABOUT CERRO BOLIVAR AND THE PEOPLE WHO HAVE HAD A PROMINENT PART IN ITS DISCOVERY AND EXPLORATION STOP WE EXPRESS OUR ADMIRATION AND CONGRATULATIONS STOP GOOD LUCK AND BEST WISHES FOR CONTINUED SUCCESS.

M. C. LAKE
President
Orinoco Mining Co.
Caracas, Venezuela, S.A.

Steelmaking, Circa 1792

Sir:

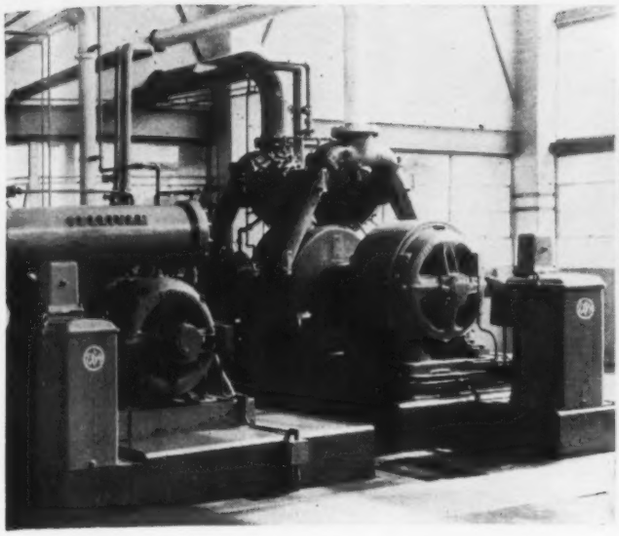
I thought you would like to see the article on "steelmaking" in the enclosed almanac which has been in our family for many years.

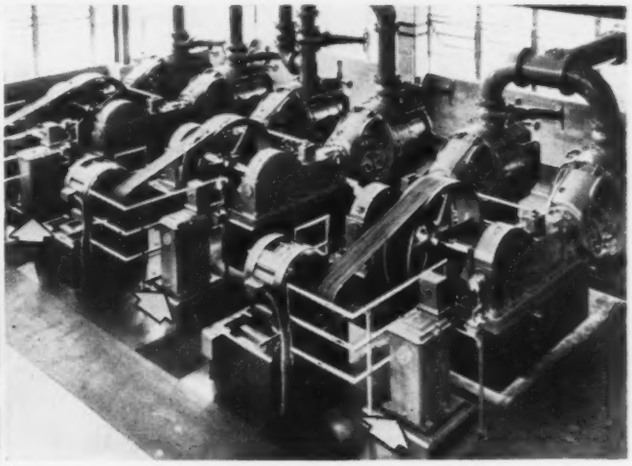
D. T. MARVEL
General Sales Manager
Western Brass Mills
East Alton, Ill.

"The other method of making ſteel if by cementation, of it if called; that if, to convert bar-iron into ſteel; which if done by a cement made of thoſe ſubſtancef which contain the greateſt quantity of phlogiſton. Put the bar-iron with thif cement into a veſſel that will bear a ſtrong fire; lute on a cloſe cover, ſo af to prevent the cement taking flame and conſuming; put the veſſel in a furnace where the barſ may be kept red-hot till they are converted into ſteel, which will be in a longer or ſhorter time, according to the bigneſſ of the barſ, and the quantity of cement."

("Phlogiſton exiſtſ in all inflammable ſubſtancef, and in ſome that are not inflammable. Charcoal, and the coalſ of bonef, hornſ and hooſſ of animalſ, have been uſed af ſubſtancef for communicating phlogiſton to iron in making ſteel.")

The above are extracts of an article by Rev. Daniel Little that appeared in "The Universal Asylum & Columbian Magazine," October, 1792.—Ed.





. . . ON AIR COMPRESSORS . . . ON VACUUM PUMPS

In Protected Rooms, in Coastal Atmospheres, in Dusty Locations...

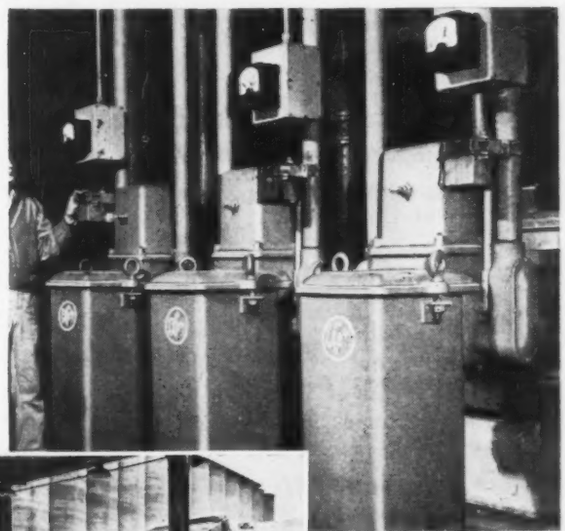
EC&M OIL-IMMERSED MOTOR STARTERS

HELP SPEED PRODUCTION IN GULF COAST PLANT

These EC&M reduced-voltage Motor Starters are very popular in industrial plants. *Automatic operation* from push-button stations brings squirrel-cage or synchronous motors up to speed quickly, safely—with greater skill than human hands can do it.

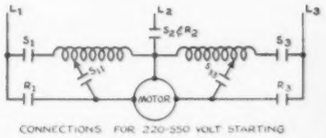
Oil-immersed, the simple double-throw contactor is always well lubricated and protected from corrosion—eliminating the need for frequent inspection or maintenance. Motor circuits are made and broken under oil—thoroughly safe, no dust hazards.

Magnetic overload relays in these starters give inverse-time-element protection and also *trip instantly* on heavy over-currents. A magnetic balance in each relay absorbs heavy starting currents and allows a *low* current-setting for accurate protection under running conditions. EC&M Motor Starters have a reputation for low up-keep cost.



. .ON PROCESS MACHINES

GRAIN RECEIVING STATION



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GLOBAL LETTER

REVIEW OF WORLD MARKETS

Rio de Janeiro jammed with 100,000 tons of iron ore . . . American importers switch orders . . . Steel cartel planned . . . English mills have record month in March.

Rio de Janeiro—Brazilian iron ore orphaned from its customary American market clogged the port here recently and authorities notified the Central of Brazil Railway to halt shipments until those on hand had been cleared.

When Swedish iron prices sank after depreciation of the krona, American importers, in a legitimate tactic of competition, did a quick about-face and transferred their business to Sweden. The port was left holding a prize bag of 100,000 tons of iron ore, property of the Companhia Mineracao Geral do Brazil.

Railway Not Adequate

Brazilian officials wince whenever the inadequacy of the Central Railway is mentioned. That carrying capacity must be increased was evidenced by the iron and steel works of Minas Geraes inability to ship their wares to Rio de Janeiro and San Paulo while large volumes of iron ore found access to the ports.

The government's Railway Reform Program plans new lines between congestion points and construction of a new port at Itacurussa with a rail link to the junction at Minas Geraes and San Paulo lines.

English March Steel Output Highest, Expected to Continue

London—English steel production for March ranked as a record annual rate of 19 million tons (of 2000 lbs). Weekly average output was 369,376 tons, equivalent to an annual rate of 19,204,640 tons. It was higher than February 1950's annual rate of 18,925,760 tons, which set a record.

Total first quarter output this year stands at 4,669,280 tons, or 232,840 tons above the figure last year. March pig iron output was at an annual rate of 10,859,520 tons, as compared with 10,410,400 tons in 1949.

Portents point to maintenance and even expansion of the production pace although order books are not uniformly filled. Demand for plates, sheets, and strips is of the voracious variety and is in excess of supply.

Demand Barometer Poor

Demand for sections and bars varies. Independent mills are operating their heavy mills at below capacity, awaiting merchant and consumer stocks of heavy bar to dwindle. The strong demand for the small sizes of bar and section is a compensatory factor. British imports of European semi-finished steel have been cut. Imports of beams and heavy sections remain high.

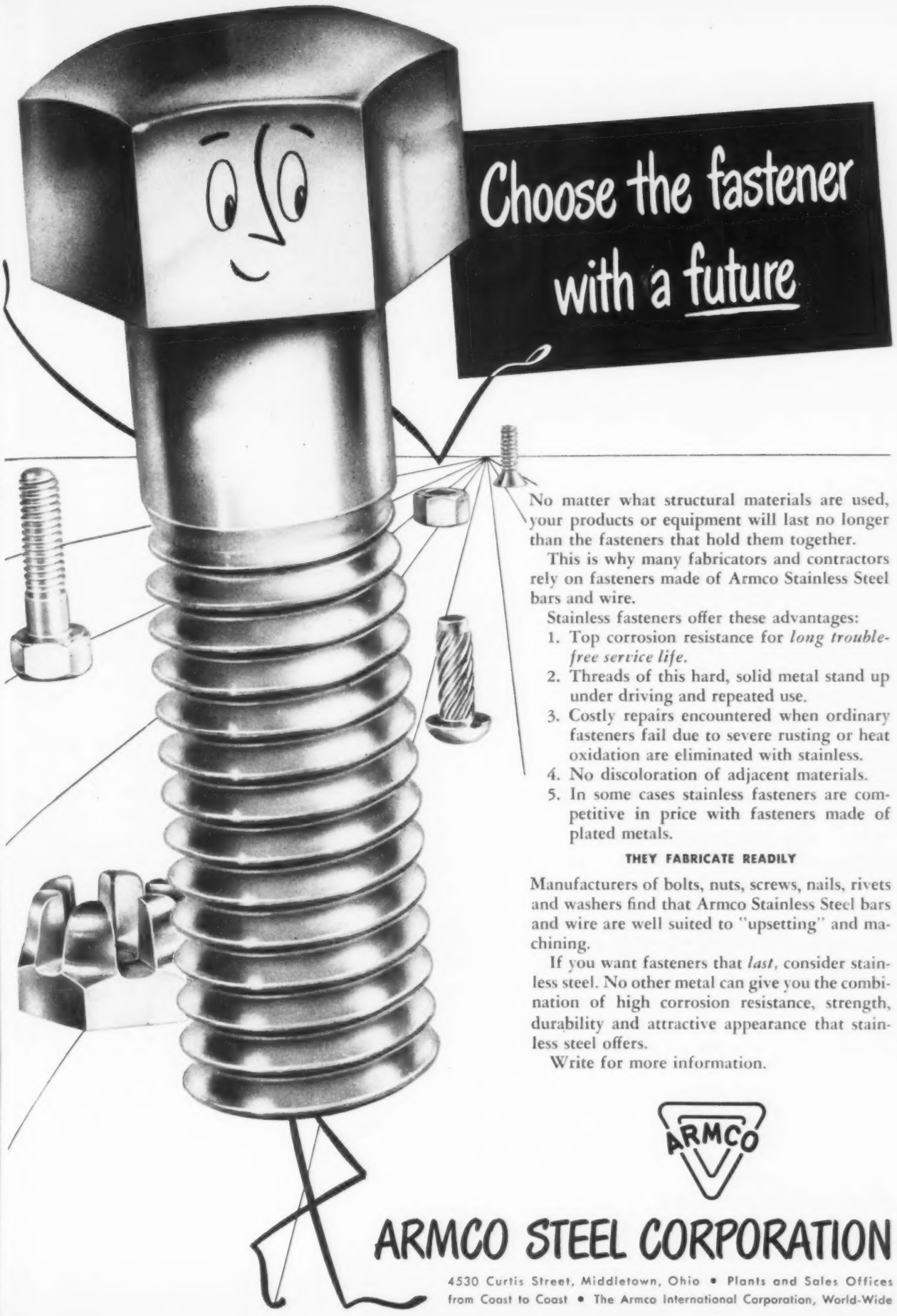
Mills here can sell all their sheets and plates exports but a stumbling block is taking shape. Demand has dropped—drastically so for some other products. Small steel bar demand from abroad is described as "miserable." French and Belgian mills are gobbling up all available orders at prices which producers here cannot meet.

Plan for Steel Cartels

Luxembourg—The formation of new regional steel cartels to dull-en competition "detrimental to Luxembourg, Belgium" and other producers following the same price trends was discussed by Prof. F. Baudhuin, of Belgium, at a recent conference here.

Prof. Baudhuin declared the decline of steel prices in international markets plied by Belgium and Luxembourg producers was caused by deadly local competition for decreasing orders. He said that wage reductions would not serve as a solution but that "unsound competition" could be skirted by cartel agreements.

Rumors of a revival of an international cartel were circulating anew but were taken with a grain of salt by the more erudite who regard the possibility as premature. They believe that the Belgium-Luxembourg cartel is practicable, though.



No matter what structural materials are used, your products or equipment will last no longer than the fasteners that hold them together.

This is why many fabricators and contractors rely on fasteners made of Armco Stainless Steel bars and wire.

Stainless fasteners offer these advantages:

1. Top corrosion resistance for *long trouble-free service life.*
2. Threads of this hard, solid metal stand up under driving and repeated use.
3. Costly repairs encountered when ordinary fasteners fail due to severe rusting or heat oxidation are eliminated with stainless.
4. No discoloration of adjacent materials.
5. In some cases stainless fasteners are competitive in price with fasteners made of plated metals.

THEY FABRICATE READILY

Manufacturers of bolts, nuts, screws, nails, rivets and washers find that Armco Stainless Steel bars and wire are well suited to "upsetting" and machining.

If you want fasteners that *last,* consider stainless steel. No other metal can give you the combination of high corrosion resistance, strength, durability and attractive appearance that stainless steel offers.

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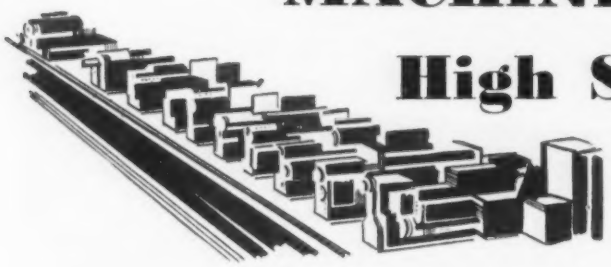


Sales Inquiries and Production

March order volume listed as best since June '46 by NMTBA . . . Detroit awaits report on Lincoln engine . . . Ford ahead

by William A. Lloyd

Cleveland—Machine tool order volume in March was the highest since June 1946, according to the monthly report of the National Machine Tool Builders Association, released this week.

Following in the wake of capacity steel-making operations, NMTBA's index of new machine tool orders rose to a preliminary 107.4 close to the postwar peak of 123.4 reached in April 1946. Index of February orders was 89.2.

March index of foreign orders, included in the total, was reported at a preliminary 25.0 compared with 18.8 for February.

Preliminary index of March shipments, NMTBA reported, is 75.4, substantially higher than February's 56.1.

Produce at Higher Rate

Ratio of unfilled orders to shipments at the end of March was 4.8 to 1, compared with 5.8 to 1 the previous month. The increase in shipments, according to competent observers, indicates that the industry is getting into production at a higher rate.

Based on first quarter order volume the industry is moving at the rate of about a $300 million per pear. On the other hand, first quarter order volume in 1949, indicated at $300 million a year, was not reached.

Order Volume Improves

The present surge in order volume which got underway last October does not represent an across-the-board increase for all companies. Distribution remains uneven.

Reports indicate that April order volume is continuing to show improvement and evidence exists that the present momentum will continue through May. A spokesman for one company pointed out that while the market has been less active than it was in March, the volume of new business entered to date is higher than new business received during the corresponding period of last month.

Progress of New Lincoln Engine Awaited in Detroit

In Detroit, machine tool builders continue to roll. Under considerable pressure from buyers delivery dates of 20-weeks minimum are fairly common, it is reported.

Deliveries for the Ford-Cincinnati transmission are listed as "urgent," according to the trade, which anticipates momentarily some significant developments on the new Lincoln engine.

Strike Slows Plans

Debatable nowadays is whether, because of possible construction delays at Cleveland, the New Lincoln engine will get into production ahead of the Ford 6. Tooling on the Ford 6 is fairly advanced, the trade reports.

Meanwhile, Chrysler is plodding along despite the strike with plans for its high compression engine. An end to the strike will undoubtedly boom the Chrysler demand. Some sources report an August deadline has been set for the Chrysler program.

Faint rumblings in Detroit of a General Motors 6 cylinder engine are heard. The question being hotly debated is whether Chevrolet, Buick, Olds, or Pontiac will build such an engine. This development is in the whispering stage, however. Studebaker engine tooling is now reaching the final stages. With the present volume of business somewhat expanded by new model developments in the Fall, Detroit is looking forward to a year of fair business volume.

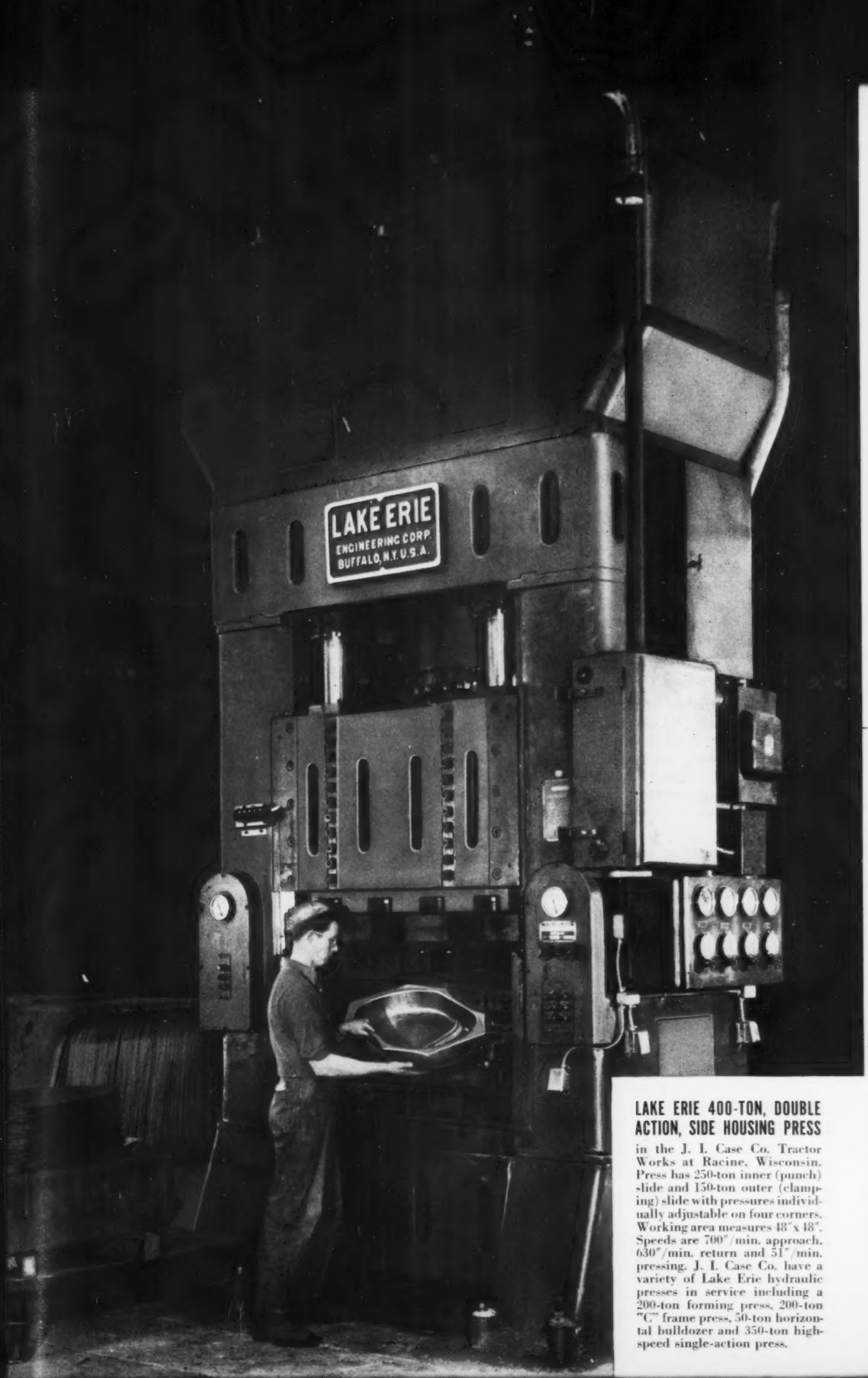
Order Backlog at High Level

Monarch Machine Tool Co., Sidney, Ohio, reported first quarter net earnings of $101,732, on net sales of $1,247,038, after taxes and other charges. It was equal to 48¢ a share on the 210,000 shares outstanding. Net earnings for the first quarter of 1949 were $117,731 on net sales of $1,841,848 or 56¢ a share.

More Pressure on Russia

Board chairman Wendell E. Whipp reported that new orders received during the first quarter should "substantially increase shipments" during the second quarter. "Our order backlog is at a higher level than it has been for the past eight months," he added.

In the East, inquiries have been placed for equipment used directly for war production, perhaps presaging the possibility that more pressure will be put on Russia.



LAKE ERIE 400-TON, DOUBLE ACTION, SIDE HOUSING PRESS in the J. I. Case Co. Tractor Works at Racine, Wisconsin. Press has 250-ton inner (punch) slide and 150-ton outer (clamping) slide with pressures individually adjustable on four corners. Working area measures 48" x 48". Speeds are 700"/min. approach, 630"/min. return and 51"/min. pressing. J. I. Case Co. have a variety of Lake Erie hydraulic presses in service including a 200-ton forming press, 200-ton "C" frame press, 50-ton horizontal bulldozer and 350-ton high-speed single-action press.

FREE USE POST CARD

PUBLICATIONS

New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.

Production Attachments

Errington drill and tap chucks, nut and screw drivers, self-opening die heads, quick change chucks, and adjustable spindle drilling and tapping heads are among the production attachments described in a new 12-p. catalog. *Errington Mechanical Laboratory, Inc. For more information, check No.* 1 *on the postcard.*

Rotating Bins

Various models of Rotabin rotating storage bins and accessories are described in an illustrated 16-p. catalog showing construction features. *Frick-Gallagher Mfg. Co. For more information, check No.* 2 *on the postcard.*

Form Dressing

Specifications and operating features of Fluidmotion radii and angle dressers are presented in a new 8-p. bulletin. *J & S Tool Co. For more information, check No.* 3 *on the postcard.*

Drill Presses

Dimensions and other engineering data for the 1100 series 20 in. hand or power feed Walker-Turner drill presses are given in a 6-p. folder. *Walker-Turner Div., Kearney-Trecker Corp. For more information, check No.* 4 *on the postcard.*

Plastic Coated Tube

Available forms, colors and materials of Dekoron plastic-armored metal tubing are listed in a 4-p. folder describing strength, weight, and dielectric properties. *Samuel Moore & Co. For more information, check No.* 5 *on the postcard.*

Materials Handling

Hallowell "700" light, medium and heavy duty steel platform trucks, stock cart, and other special trucks are described in a new 4-p. bulletin. *Standard Pressed Steel Co. For more information, check No.* 6 *on the postcard.*

Sand Facing

A new 4-p. leaflet cites advantages of NVX, a water-miscible neutral resin for the foundry industry, in green sand facing, as determined in daily use by experienced foundrymen. *Hercules Powder Co. For more information, check No.* 7 *on the postcard.*

Lithium Chemicals

Significant developments in lithium chemistry since 1940 are reviewed in a new 28-p. booklet entitled "Lithium in Modern Industry," which also contains a bibliography of technical references on the subject. *Foote Mineral Co. For more information, check No.* 8 *on the postcard.*

Contour Projector

Optical comparison comes out of the tool room into the inspection line with the new Kodak contour projector, as described in an 8-p. bulletin. *Eastman Kodak Co. For more information, check No.* 9 *on the postcard.*

Cold Finishing

The line of Medart machines for straightening, centerless turning, billet peeling, polishing and roll grinding are described in a new 4-p. folder. *Medart Co. For more information, check No.* 10 *on the postcard.*

Steel Shelving

Deluxe steel storage shelving, shop equipment, steel library shelving and steel storage cabinets are described in a 52-p. catalog showing construction features and illustrating a number of models. *Deluxe Metal Furniture Co. For more information, check No.* 11 *on the postcard.*

Alloy Chisels

Sizes and prices of various types of Delsteel Safe-T-Kut alloy steel chisels for hand, pneumatic and electric hammer use, are listed in

Turn to Page 152

USE THIS POST CARD

NEW

PRODUCTION IDEAS

New and improved production ideas, equipment, services and methods described here offer production economies. For price and other information, fill in the attached card and mail it.

Magnetic Pulleys

Improved models of permanent magnetic pulleys provide increased magnetic power, lighter weight and greater structural strength. These magnetic separating devices remove tramp iron from materials being processed in the metalworking, chemical, milling, and ceramic industries. They are made to carry 12, 15, 18 and 20-in. belts of rubber, leather, canvas, stainless steel sheet or any other non-magnetic material. The new design gives uniform flux distribution from end to end of the pulley and full width of the belt. *Eriez Mfg. Co. For more information, check No. 25 on the postcard.*

Wafer Valves

Based on the principle that face-to-face dimension does not reduce torque, one-piece body casting valves have been developed with many of the rugged features of standard double flanged units. Vane, shaft assembly, handwheel control with self-locking worm and gear and flareout on body casting accommodate a large mounting bracket. In open position the beveled streamlined vanes create a Venturi action. Pressure drop is low, saving pumping power. These valves are used for air, gas, liquids, steam and semi-solids in the shut-off and regulation of volume and pressure. *R-S Products Corp. For more information, check No. 26 on the postcard.*

Spray Gun

A new spray gun designed for accuracy and four-finger control speeds and simplifies spray painting, making it possible to control the spray pattern from the size of a silver dollar up to a swath 12 in. wide. A new type controllable nozzle features low pressure principle, effective in reducing fumes, minimizing air consumption and saving paint. A stream of atomized material in a workable pattern can

NEW

PRODUCTION IDEAS

Continued

be projected to normally inaccessible surfaces up to 6 ft beyond the operator's reach. *Eclipse Air Brush Co. For more information, check No. 27 on the postcard.*

Single Pass Broach

The Glenny SP push broach has been redesigned to incorporate a new cutting blade with 12° rake angle teeth. Because teeth are sharpened on front face only, blending ground face into chip contour, this new blade can be resharpened repeatedly with no loss in cutting tolerance. Broaches are available in diameters ranging from ¼ to 2½ in. in increments of 1/32 in. Longer body and cutting blade facilitate single-pass cuts. *Kase Machine Co. For more information, check No. 28 on the postcard.*

Solid Wheel Holder

A new holder for cylinder grinding wheels is available for the No. 11 and No. 18 Blanchard surface grinders. Specially designed spring clamps, three for the No. 11 and five for the No. 18, hold a wheel as securely and efficiently as sulphur. These solid wheel holders eliminate sulphuring wheels into rings. Only a few minutes is required to change wheels. *Blanchard Machine Co. For more information, check No. 29 on the postcard.*

Stereoscopic Microscope

A new, lower priced Spencer Stereoscopic microscope incorporates enhanced three-dimensional vision, wide and flat fields, comfortable angle of vision, dustproof nosepiece, and enclosed gearing for interpupillary distance control. To extend or reduce focusing range, the head of the instrument is raised or lowered to any of three positions by removing and replacing a thumb screw. The stage is of the platen type. No. 20 microscope is available with single, double or triple nosepieces; vertical or inclined binocular bodies; and a wide selection of objectives and eyepieces. *American Optical Co. For more information, check No. 30 on the postcard.*

Photoelectric Eyes

A new standard line of accessories for photoelectric relays, consist of a range of improved light sources and phototube holders. General purpose light sources have simple snap-on covers that make possible lamp replacement in 20 sec. Prefocused lamps are used throughout. The accessories can be applied with photoelectric relays for counting, signaling, limiting, controlling, or protecting. *General Electric Co. For more information, check No. 31 on the postcard.*

Barrel Filler

An automatic check valve that operates when a barrel is full, preventing overflow, is a feature of the improved Penflex automatic barrel filler. It will operate with light and heavy liquids, hot or cold, under pressure or gravity. Volatiles and crude viscous residue can be handled with equal efficiency. *Pennsylvania Flexible Metallic Tubing Co. For more information, check No. 32 on the postcard.*

Aluminum Screw Joint

A new lightweight connecting screw joint is made of high alloy aluminum tubing with a machined thread and knurled exterior for convenient tightening or loosening. The joint fastens any type of rods, handles, poles together and can be used on solid or hollow stock. Sizes include ½, 9/16, ¾, 13/16 and ⅞ in. *Minit-Joint Co. For more information, check No. 33 on the postcard.*

Openside Shapers

Hy-Draulic openside shapers with stroke lengths of 48, 60 and 72 in. increase the capacity of this machine to accommodate longer shaper

4/27/50

THE IRON AGE, New York 17, N. Y. **2**

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Price information ☐ on items circled below.

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43	44	45	46	47	48	49	50	51	52	C1	C2	C3	C4

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hand or power feed Walker-Turner drill presses are given in a 6-p. folder. *Walker-Turner Div., Kearney-Trecker Corp. For more information, check No. 4 on the postcard.*

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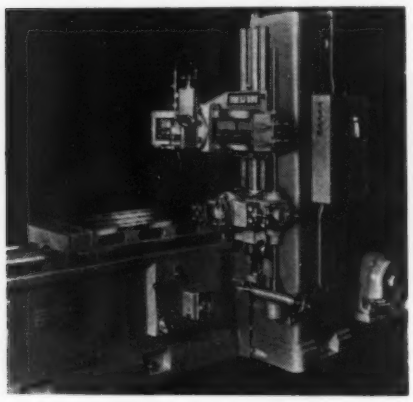
120 DIETZ ROAD

NEW PRODUCTION IDEAS

Continued

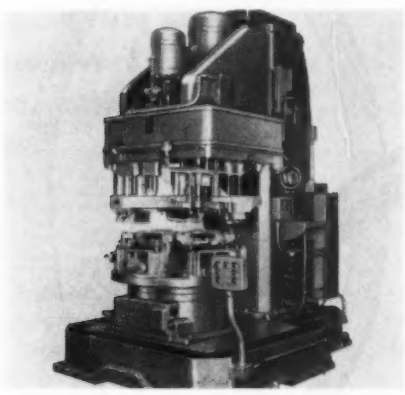
and small planer work. The driving motor is mounted to the side of the bed directly behind the column. The work table is a box-section, supported by a double-length bed.



The column has a heavy cross section and supports an adjustable cross-rail. Hydraulic drive and feeds provide a continuous range of cutting speed and feed changes. The hydraulic drive provides quick reversals and fast table returns. *Rockford Machine Tool Co. For more information, check No.* 34 *on the postcard on p.* 37.

Multi-Operation Machine

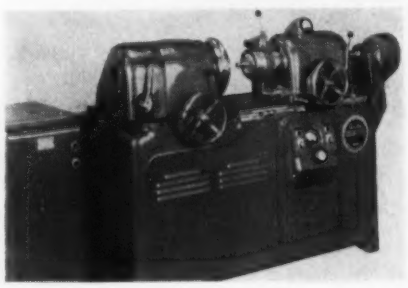
A new automatic multi-operation Holesteel machine performs 2700 operations per hr at each of



four positions simultaneously—drilling, reaming, rough and finish counterboring, chamfering, spotfacing and tapping both sides of a part at the rate of 90 parts per hr. The machining on both sides of the parts is done at four stations. It is simultaneous and completely automatic. The operator's duties are to unload finished parts, and transfer parts from station 1 to station 2. *National Automatic Tool Co. For more information, check No.* 35 *on the postcard on p.* 37.

Gear Sound Tester

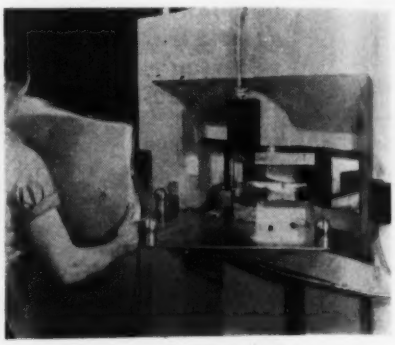
Sound testing gears prior to assembly is possible on a new Red Ring gear sound tester, Model GSQ, operating heads of which have their own dc motors, controlled through a single rheostat. The gear set or sub-assembly under test may be driven by either head, while the opposite head is used as a brake



or to simulate gear loading under actual conditions. The amount of test load is indicated by an ampere meter and a tachometer registers the speed, recording gear performance for any combination of load and speed. Two models of sound testers accommodate internal or external gears up to 14 and 24 in. diam, respectively. *National Broach & Machine Co. For more information, check No.* 36 *on the postcard on p.* 37.

Corner Draw Press

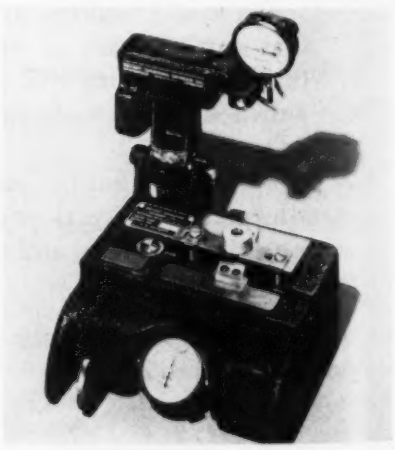
A one-corner-at-a-time hydraulic drawing press known as the Vulcan-Draw is said to eliminate costly die and labor operations usually associated with notched and welded corners. The flat sheet is placed in position (one corner) in the Vulcan Draw and the operator steps on an actuating pedal. In the normal few seconds hydraulic cycle the sheet is released with the corner completely drawn and finish sized. By rotating, the other corners are formed, with specified overall panel dimensions held. Need for hand welding, metal finishing operations and separate dies for each size panel are eliminated. The tooling consists of a single corner punch and die. Radii and panel sizes from 15x18 in. to



the largest panel handled can be corner formed from the flat sheet as received from the steel mill source. *Vulcan Tool Co. For more information check No.* 37 *on the postcard on p.* 37.

Thread Gage

Reduced inspection time and increased accuracy of checking threaded parts are claimed for the No. 11 thread gage that uses interchangeable segments so that a wide range of internally and externally threaded parts can be checked on the same basic gage. Internally

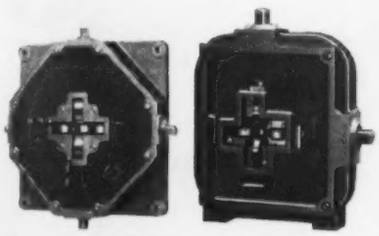


threaded parts can be checked for fit and inspected for roundness in one operation at the rate of 0.07 min, with operator fatigue low because only the part is handled. One

Turn to Page 154

METAL FORMING NEWS

Turks Heads Do Away With Costly Delivery Delays



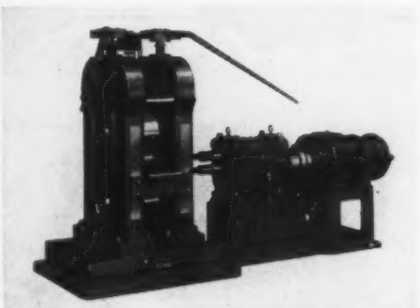
SHAPE WIRE QUICKLY . . . accurately . . . economically with Turks Heads.

With a Turks Head and wire flattening mill in tandem, manufacturers can produce their own key stock. No need to wait 8 to 10 weeks on deliveries.

Turks Heads do away with draw dies, form rod and wire to square, rectangular, keystone, diamond or special shapes. They are highly accurate, take a greater reduction per pass and use less power than other methods of shaping metals.

With the universal Turks Head, square and rectangular shapes may be produced in varying dimensions by simple roll adjustment thereby eliminating costly inventory of multiple die sizes.

Precision Four-High Heavy Duty Mills Finish Sheets Accurately To A Thin Gauge



FENN FOUR-HIGH HEAVY DUTY MILL above has work rolls 5⅜" diameter and backing rolls 14" diameter.

The Fenn Four-High Heavy Duty Mills win considerable comment for outstanding efficiency wherever they are operated. These mills are used largely in finishing sheets of all types of alloys, ferrous, and non-ferrous.

The secret of their outstanding performance is the small diameter of the two working rolls and the extreme accuracy which our craftsmen build into the mills. Because of the small diameter work roll, a larger reduction can be made per pass with less work hardening. The heavy backing rolls together with Fenn's precision workmanship insure accurate gauges and extremely small tolerances. Working roll sizes range from 1½" diameter and 3" face width to 7" diameter and 16" face width.

A convenient feature of these mills is that they can be arranged either in tandem or as a single stand. Where the type of operation cannot economically permit the use of tandem mills, a reversing drive will allow a single mill to do the job and is a welcome plus. These mills can be furnished with single handwheel manual screwdown or electrical screwdown for roll adjustments.

Through these Fenn mills, manufacturers can rely on consistently good results in sheet-flattening. Single, reversible action mills are available for small quantities, tandem units are available for large-scale production.

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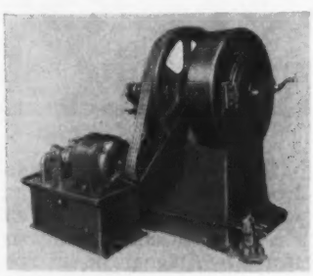
See how swaging improves physical characteristics of metal — permits improved grain structure, tensile strength, elasticity. A 16 mm. 26-minute sound motion picture is available free on request. For film, just write The Fenn Manufacturing Company direct.



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A patented hydraulic principle of wedge opening of dies is the secret back of the unique Fenn Hydro-Former performance which permits swaging at any cross section of the piece.

Ball type fittings that cannot be swaged on ordinary rotary swagers can now be swaged on this remarkable machine. In one operation, the Fenn Hydro-Former connects tubings or cables to solid fittings with joints equivalent to welds or rivets in strength. Comes in three sizes.

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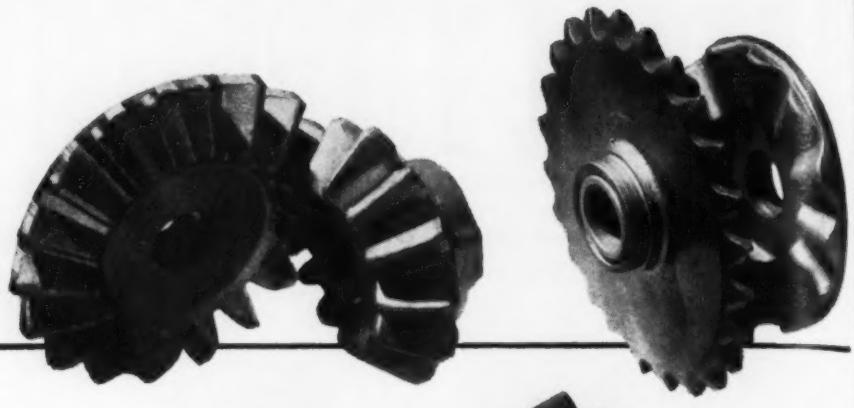

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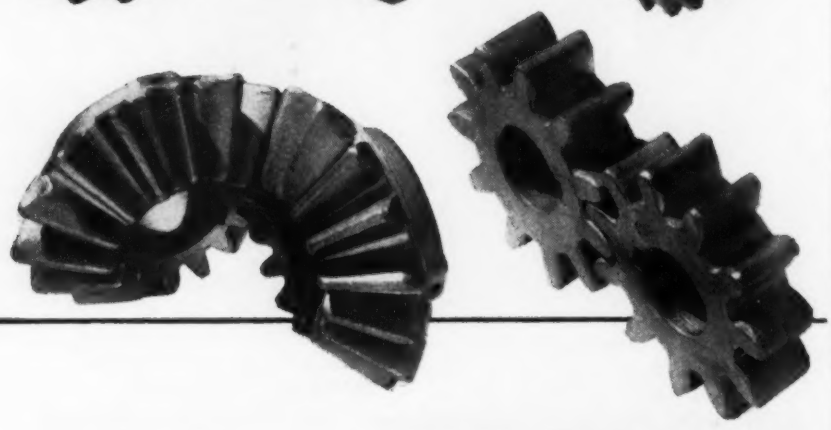

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Iron Age *Introduces*

ROY D. HAWORTH, JR., manager, product development dept., carbide div., Allegheny Ludlum Steel Corp.

M. E. BROOKS, chief mechanical engineer, Aluminum Co. of America.

GUSTAF PETERSON, consulting metallurgist, Edgcomb Steel Co.

Roy D. Haworth, Jr., has been appointed manager of the product development department, carbide div., of the ALLEGHENY LUDLUM STEEL CORP., Detroit. Mr. Haworth was formerly superintendent of abrasion research, Armour Foundation, Illinois Institute of Technology in Chicago.

John L. Carmichael has been appointed general purchasing agent, Delco Appliance Div., GENERAL MOTORS CORP., Rochester, N. Y.

Walter A. Zielke is the new general director of production control for FISHER BODY DIV. He succeeds **Herbert E. Shutt,** deceased.

M. E. Brooks was appointed chief mechanical engineer for ALUMINUM CO. OF AMERICA, succeeding **Benjamin C. McFadden,** who is retiring from active service with the company after 26 years. Mr. Brooks has served as his assistant since 1948.

Daniel Wardlaw was elected to the post of vice-president in charge of coated abrasive manufacturing for the MID-WEST ABRASIVE CO., Owosso, Mich. Mr. Wardlaw has been with the company 19 years.

Arthur R. Diamond, formerly special representative of the JACKSON-WALTER CO., has been named vice-president of TOOLS, INC., Ardmore, Pa.

Gustaf Peterson has been appointed consulting metallurgist for the EDGCOMB STEEL CO. of Philadelphia and Charlotte, N. C. He has been associated with the Edgcomb organization for 16 years. **Robert Shattuck** will succeed Mr. Peterson as manager of tool steel sales.

Paul Garrett, who had been serving YORK CORP., York, Pa., as commercial service supervisor of the southwest district, has been transferred to the home office at York.

Alexander Toben, formerly associated with LEDEEN MFG. CO., Los Angeles, and most recently with CARDWELL MFG. CO., has rejoined Ledeen.

IRON AGE INTRODUCES

Continued from Page 61

Donald C. Burdette was appointed manager of the used car and truck sales dept. of Ford Div., FORD MOTOR CO. He succeeds **Robert R. Nadal**, who was recently named director of the dealer development office.

N. E. Lockhart was made assistant parts and accessories manager in charge of warehouse operations for LINCOLN-MERCURY DIV. **J. K. Neeley** was appointed depot manager and **Arthur Superko** will be assistant depot manager.

Nicholas Kondur was named manager of mold manufacture of the plastics div., GENERAL ELECTRIC'S chemical dept.

Henry Waldes becomes executive vice-president of WALDES KOHINOOR, INC., Long Island City, N. Y.

Paul F. Bronckhurst, formerly West Coast representative of leading American engineering and construction companies, has joined the staff of KAISER ENGINEERS, Oakland, Calif.

Frank L. Blodgett was appointed sales manager, hard surfacing div., with headquarters in York, Pa., for the ALLOY RODS CO.

Robert C. Bennett, Jr., is the new vice-president and sales manager of NATIONAL ELECTRIC PRODUCTS CORP., Pittsburgh. Mr. Bennett was also named a member of the company's board of directors. He has taken over the responsibilities of **Harold J. Newton,** recently retired. Since 1948 Mr. Bennett has served as general manager of the company.

LEE N. BLUGERMAN, manager of Red Lion Plant, Budd Co.

EDWIN F. BATES, manager of Chase Plant, Budd Co.

Clarence M. King, former assistant treasurer and assistant secretary, has been made treasurer of MINNESOTA MINING & MFG. CO., St. Paul, Minn. **George H. Schoettly** and **Edwin H. Church** are new assistant treasurers.

William G. Morrison was made executive assistant in matters pertaining to sales to **Edgar F. Kaiser,** president of KAISER - FRAZER, CORP.

Alexander H. d'Arcambal and **Edwin J. Schwanhausser** have been elected to the board of directors of NILES-BEMENT-POND CO., West Hartford, Conn. Mr. d'Arcambal joined the Pratt & Whitney Div. in 1919 and has directed the program of metallurgical development as applied to machine tools since that time. Mr. Schwanhausser is executive vice-president of the WORTHINGTON PUMP & MACHINERY CORP., Harrison, N. J.

Edwin F. Bates, formerly manager of the Red Lion Plant of BUDD CO., Philadelphia, has been appointed manager of the company's Chase Plant, now under construction in Gary, Ind. The Chase Plant, which is scheduled for completion in the fall, will manufacture automobile body components for Studebaker and Nash. **Lee N. Blugerman** was named as manager of the Red Lion Plant, to succeed Mr. Bates. He has been works manager since 1949.

William W. Smith, Jr., was elected to the newly created posts of executive vice-president and secretary of JOHN HASSAL, INC., Brooklyn.

Ransom B. DeLisle was appointed purchasing agent for the PITTSBURGH METALLURGICAL CO., INC., Niagara Falls, N. Y. **Stuart C. Du Tot** was named general manager-sales for the company.

ROBERT C. BENNETT, vice-president and sales manager, National Electric Products Corp.

ALEXANDER H. d'ARCAMBAL, member of the board of directors, Niles-Bement-Pond Co.

EDWIN J. SCHWANHAUSSER, member of the board of directors, Niles-Bement-Pond Co.

John W. Unroe has been appointed general manager of the Steubenville Works, **WHEELING STEEL CORP.**, succeeding the late **William H. Warren.** Mr. Unroe had been assistant to Mr. Warren.

Emmet F. Harding, formerly general sales manager of AMERICAN HARDWARE CORP.'S Corbin Screw Div., New Britain, Conn., has joined RUSSELL, BURDSALL & WARD BOLT & NUT CO., Port Chester, N. Y., as manager of screw sales.

C. R. Boyer has been appointed production engineer and **L. F. Green** assistant production engineer, of DRAVO CORP., Pittsburgh. Mr. Boyer, who also heads the company's cost engineering department, has been with Dravo since 1936. Mr. Green joined the company in 1941.

W. S. Howard was made sales engineer for automotive castings for the LAKE CITY MALLEABLE CO., Cleveland. Mr. Howard was chief inspector and more recently the director of quality control with WHITE MOTOR CO.

Fred J. Reynolds has been appointed representative of the BRAINARD STEEL CO in Iowa and Rock Island County, Ill. Mr. Reynolds was formerly associated with WEIRTON STEEL CO. and STEEL SALES CORP.

Dr. George H. Zirker was named to the post of chief metallurgist of BURNDY ENGINEERING CO., INC., New York. Prior to his association with Burndy, Dr. Zirker was connected with FOUNDRY SERVICE, INC., in a similar capacity and has served for over 30 years as foundry consultant and metallurgist for various steel and metal organizations.

Turn to Page 64

DR. GEORGE H. ZIRKER, chief metallurgist, Burndy Engineering Co., Inc.

Iron Age Salutes

GEORGE M. HUMPHREY

IT seems ridiculous to hear government people warning the steel industry about an iron ore shortage now. Steel people were aware of it several years ago; and have been doing something about it.

The quest for iron ore—when this nation is becoming a have-not—is not horse play. It is big. It takes a gambling spirit. It means getting people and money together. It takes the same old pioneer spirit as when the industry was a sapling.

George M. Humphrey is one of those hard-hitting gamblers and pioneers. There are many more, that's for sure. But this fellow doesn't get in the news very often. When he does he is either roundly damned or praised for what he does or says.

Right now he is in the thick of trying to get something done about the St. Lawrence Seaway. He wants it because he believes it will be the means of getting iron ore down from Canada—quicker and cheaper.

When this ore comes to this country in 5 or 6 years a fair share of credit will go to George Humphrey. Hanna and Hollinger people found it in their quest for base metals during the war.

George Humphrey managed to get five American steel firms interested in getting the ore out; and now the job is on its way.

You just can't wave a wand and get such things done. George Humphrey has surrounded himself with men who can get other people to get the things done he wants done. He is a tough egg and he knows it. But he commands respect; and he believes that one has to take a chance on being wrong as well as right.

George Humphrey was blamed by some of the press for yielding to John L. Lewis a few years ago. The inside story was that top government officials put tremendous pressure on him to get that coal strike settled quickly. He made the best of a bad mess.

He did the same kind of a job when he was sent to Germany to make a confidential report on plant dismantling. Time proved he was right. His recommendations were kept secret but later they were followed—much later.

George Humphrey had a good basic training for his present responsibilities. He first went to work in a law office at the age of 21. Then, at 28, he went to M. A. Hanna Co. as general attorney. He was made president in 1929—a job he still holds. He may tangle with people but he gets things done.

Iron Age *Introduces*

Continued from Page 63

Ernest C. Brelsford has been elected assistant treasurer of THOMPSON PRODUCTS, INC. For the past 5 years he had been assistant to treasurer James H. Coolidge. Prior to 1942, Mr. Brelsford was a partner in F. EBERSTADT & CO., New York investment bankers. From 1942 to 1945 he was assistant treasurer of WESTON ELECTRICAL INSTRUMENT CORP., Newark, N. J.

Andrew R. Cochrane, Wendell A. Falsgraf and **John F. Lott** have been elected to the board of directors of the HAMILTON STEEL CO., Cleveland. Messrs. Cochrane and Lott are associated with FORT DUQUESNE STEEL CO., Pittsburgh, parent company of Hamilton Steel.

William C. Spencer, Jr., was appointed Baltimore district manager of the HORACE T. POTTS CO. He replaces **J. Theodore Fritz**, who has retired. **Ralph F. Bickel** will serve as assistant manager and **John W. Reckard** has been appointed manager of steel sales in the Philadelphia area.

J. C. Redmond has been elected president of TRANSUE & WILLIAMS STEEL FORGING CORP., Alliance, Ohio, succeeding **J. R. Gorman**, who recently died. **Emery Cook**, who has been sales manager, succeeds Mr. Redmond as vice-president in charge of sales.

P. A. McTerney was named administrative assistant to **J. M. Crawford**, manager of GENERAL ELECTRIC'S large motor and generator divisions. **S. V. Travis** will assume Mr. McTerney's former post as manager of sales for the large motor and generator divisions. **L. H. Matthes** will serve as assistant manager of sales for the division.

Howard F. Tway has been appointed sales representative of the GRIFFIN WHEEL CO., with headquarters at Kansas City, Kan.

Dana W. Atchley, Jr. was made director of engineering for TRACERLAB, INC. At the same time, **William A. Kerr** has been appointed general sales manager.

E. W. Harwell has been elected a director and **G. A. Krebs** assistant treasurer of FORT DUQUESNE STEEL CO.

GORDON H. BANNERMAN, manager, tramway div., Columbia steel Co.

OLIVER W. BONNAFE, vice-president in charge of research engineering, Lapointe Machine Tool Co.

Gordon H. Bannerman, nationally known aerial tramway engineer, has been named manager of a newly created tramway div. of COLUMBIA STEEL CO. Mr. Bannerman is joining Columbia Steel from the New Haven, Conn., plant of AMERICAN WIRE & STEEL CO., with which he has been associated since 1920.

John D. Cook becomes representative in the north Indiana area for KENNAMETAL, INC., Latrobe. Pa. Other additions to the organization's service personnel are: **William J. Bruun**, Chicago; **Harry E. Brandvik**, Chicago; and **Edward J. Novack**, Philadelphia.

John A. Menster has been appointed assistant manager of sales for the welded tube div. of BABCOCK & WILCOX TUBE CO., Alliance, Ohio.

Oliver W. Bonnafe was recently elected vice-president in charge of research engineering at the LAPOINTE MACHINE TOOL CO., Hudson, Mass. Mr. Bonnafe has been associated with Lapointe for over 30 years.

B. F. Galle is the general works manager for MILLS INDUSTRIES, INC., Chicago.

James R. Williams was recently named sales promotion manager of the SIGNODE STEEL STRAPPING CO., Chicago. Mr. Williams has been with the company since 1946 and prior to his appointment as sales promotion manager was located in the Portland, Ore., office.

J. S. Robbins has been named sales engineer for VULCAN MOLD & IRON Co., Latrobe, Pa.

OBITUARIES

Nathaniel Willis Judkins, chairman of the board of the Belmont Stamping & Enameling Co., New Philadelphia, Ohio, died on Mar. 31.

Charles F. Northup, formerly Syracuse representative of Brown & Sharpe Mfg. Co., died on Apr. 3 at the age of 87.

Donald G. Clark, 58, former director of purchases for Gulf Oil Corp., died at West Dennis, Mass., on Apr. 8.

Francis I. Kemp, manager of the vertical turbine pump div., Worthington Pump & Machinery Corp., died on Apr. 14.

Raymond T. Mesker, secretary, Aluminum Industries, Inc., Cincinnati, passed away recently in Santa Monica, Calif.

Jesse Smith Langston, assistant manager of sales, bar div., Republic Steel Corp., died Apr. 5, at the age of 67.

Maurice J. Mulligan, senior research chemist, General Motors Corp. research laboratory, died recently. He was 50.

Fred Mitchell, who had been connected with the Milwaukee Bridge Co. for over 35 years, died on Apr. 5.

A. W. Wigglesworth, formerly president of Hill-Clarke Machinery Co., passed away at Miami Beach, Fla., on Mar. 31.

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On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

Chrysler strike cost runs into millions . . . Union still seeks a 10-cent package . . . Dealers' stocks shrinking . . . Boeing tells results of tests on turbine-powered trucks.

by Walter G. Patton

Detroit—As this is written the Chrysler strike again appears close to a settlement—after more than 12 weeks of idleness for 89,000 workers and thousands of angry words between the strike participants.

The cost of the strike has run into millions. A week ago, *Automotive News* estimated that each Chrysler striker has lost $750 in wages. The same source estimated that each Chrysler dealer has lost an estimated $18,200 in discounts. The aggregate loss to all Chrysler dealers is close to $200 million, according to *Automotive News*.

During the weeks of haggling there has been no important change in the benefits that will go to Chrysler pensioners. They still will receive approximately $100, less social security. Chrysler has agreed to fund its pension plan but the final details are not yet clear. This is a Chrysler concession. The company has reduced its pension requirements from 1800 hr a year to 1700 hr. Other than this there has been practically no change in the position the company assumed at the start of the strike.

Both Sides Throw Brickbats

Exchanges between the company and the union have been consistently bitter. For example, in its monthly publication, *Ammunition*, the union charges Chrysler intimated that if the union wanted to interpret its "3¢ imitation pension" as a 12¢ pension package, the company would have no objection. "Tell them this pension is worth 12¢ an hr. We won't challenge what you say. Take the offer and cover yourselves with glory," is the way the union has referred to this alleged discussion.

Whatever the true facts may be, it is evident the union is emphasizing a 10¢ package idea at every opportunity. This has been the case with Chrysler from the start. Any departure from this position has been inconsequential, most neutral observers feel. The union has placed a 10¢ value on the Ford agreement and this has not been contested by the company. The union is using a 10¢ lure in other negotiations currently in progress.

Herman L. Weckler, Chrysler Corp. general manager, has openly charged the union with continuing the strike to prop up its demands on GM. Weckler estimated the union has assessed its members $7 million for striker relief but had spent only $2 million. Walter Reuther has replied to this charge by calling Weckler a "poison pen propagandist."

In a public statement, Emil Mazey, secretary-treasurer of the UAW-CIO, has agreed that the estimate of union expenditures of $2 million is substantially correct Mazey listed direct donations to local unions of $1,663,600. The cost of strikers' insurance premiums paid by the union for March and April is $377,158. Newspaper advertising and radio time cost nearly $45,000.

Question on Collection

The company and the union are miles apart in their estimates of income collected from the strike. Mazey estimates strike collections up to the present time at $2,078,110 from the emergency strike assessments. The specific period covered is not described by Mazey and it is not known whether or not collections include all assessments levied or due. To a bystander it seems improbable that

the company would miss its guess of union income by such a wide margin.

Growing Line-up for New Cars

Waiting lines for new cars are lengthening. Despite record auto production, the combined effect of the Chrysler strike and unprecedented sales is reducing dealers' stocks all over the nation.

Sales managers of most automobile companies will tell you the very least of their worries is new car stocks in dealers hands. Auto plants are being bombarded with telegrams from dealers asking for more cars. While the spring selling season is still not over, auto stocks are undoubtedly much lower than the peak reached last August.

Boeing Releases Results Of Turbine-Powered Truck Tests

The final competitive position of the gas turbine in the automotive field is still far from settled. However, an announcement this week of the successful completion of tests on a 200 lb Boeing turbine in a ten-ton truck has focused considerable attention on this subject. As pointed out previously in this column (THE IRON AGE, Apr. 20) most automobile engineers appear to be unconvinced that the gas turbine will replace the modern reciprocating engine for passenger cars in the near future. At the same time, good prospects for gas turbines in certain segments of the truck field have been readily accepted from the outset.

Announcing the results of the tests, William M. Allen, Boeing president, pointed out that the new turbine powered truck was quieter than the conventional diesel truck, runs equally well on gasoline, kerosene, light or heavy fuel oil, and weighs about 2500 lb less than a conventional engine and occupies only 13 pct as much space.

Externally, the present experimental truck differs little from any other truck. Boeing points out, however, that cab-over-engine trucks could be much simplified.

FIRST FRUITS: Kaiser-Frazer production lines are filled again after the firm's retooling for 1951 models. Shown is one of two trim lines on which Kaiser and Frazer bodies are readied for final assembly. The first '51 Kaisers should reach dealers' showrooms by the end of April.

Starting is accomplished with a simple starter button which brings the turbine up to idling speed. The fuel valve is then turned on. There is no transmission and the truck operates in much the same manner as "fluid drive." A pedal is used for shifting from one gear to another or for reversing. Speed is controlled with the usual foot throttle.

Experiments to Continue

The new Boeing gas turbine has been under development since 1943 and 60 engineers are engaged in research on the problem. Tests are continuing and will include regular freight hauling over mountains and highway endurance runs.

The present obstacles of the gas turbine are (1) high first cost which increases rapidly as attempts are made to increase operating temperatures, and (2) high fuel consumption, particularly at idling speeds. Another factor that may have to be reckoned with even if all operating and cost problems are solved is the critical materials situation. While researchers are convinced that most of the turbine materials problems will be solved in time, it is now freely predicted that the development of cooling systems for gas turbines offers a much more promising approach than the possibility of developing alloys with phenomenal high temperature properties.

Welding Conference Held

Personnel of research groups, equipment manufacturers, and users were at the Detroit Conference on Electric Welding held here from Apr. 5-7. They attended technical sessions on arc welding, research and equipment, instrumentation, special welding process, and equipment and power supplies for resistance welding.

Sponsors were the American Institute of Electrical Engineers, the American Welding Society, and the Detroit Industrial Engineers Soc. Demonstrations and exhibits were presented by 24 firms.

Green Is Car Buyers' Choice

Green has become top color for the automotive industry.

An analysis of sales of Chrysler Div. cars during 1949 shows that 26.1 pct of the buyers selected one of four shades of green offered by the Chrysler Div. Blue was second in favor with 23.2 pct while black has fallen to third place with 17.3 pct of sales.

Other buyer preferences were in the following order: gray, maroon and silver.

Buick Sales Hit Record Mark

Buick's business is still booming. The first ten days of April show a gain of 73 pct in sales as compared with a year ago, according to Ivan L. Wiles, general manager.

Total sales during the first ten days aggregated 16,351 Wiles said.

FORGINGS BY FINKL

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One of two 15 ton helical gear blanks in various stages of production: after forging and iso-thermal treatment; lowering into water quench; rough machined after complete metallurgical inspection and approval.

Finkl developed Nickel-Chrome-Moly forgings out-perform ordinary commercial alloy types by a wide margin, are of comparable cost, and decidedly more economical when their longer service is considered. They have the strength, stamina, and fatigue resistance needed to withstand the severe stresses of modern production schedules.

Forging, heat treating, and machining operations are accomplished with skill, experience, and the most modern equipment. Forgings of carbon, alloy, and stainless steels ranging from a few pounds to 50,000 pounds apiece are within the scope of the Finkl Organization.

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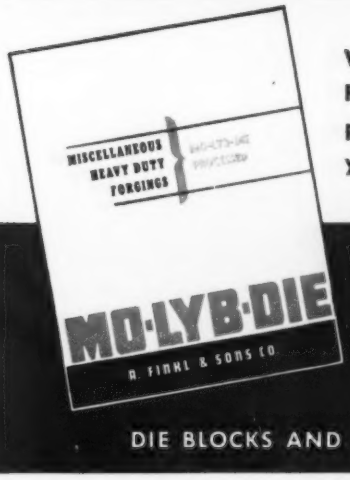

Write for the 16 page free booklet on "Heavy Duty Forgings". Profusely illustrated, it shows forgings of all sizes in every phase of development from ingot to finished product. Send your name, company name, address, and your position.

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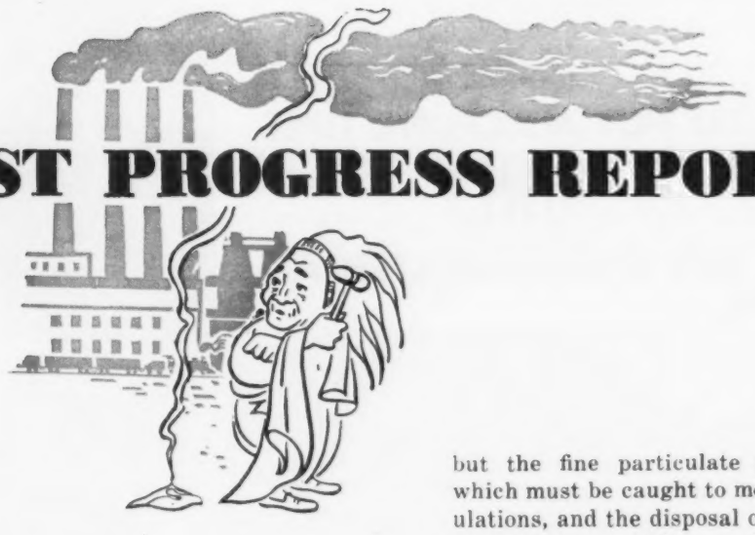


WEST COAST PROGRESS REPORT

Gray iron foundries strive to find practicable smog control plan . . . Four theories flop . . . Wenatchee reopens its plant.

Digest of Far West Industrial Activity

by J. J. Reinhardt

Los Angeles—While most industries in Los Angeles County are working on the installation of air pollution control equipment, the gray iron foundries remain in a quandary as to which direction they should turn.

Equipment ranging from a few thousand dollars to such as the $600,000 installation of Columbia Steel, is being worked upon and smog control authorities insist that major inroads to eliminate the dark air will have been made by fall.

Four Theories Fail

The gray iron foundry situation was put best by one of those experimenting with equipment when he said:

"The more we learn about it, the more complicated it seems."

Although they have been working at an intensified pace for more than a year, there still are four theories as to the best method of control and none of them have proved able to meet specifications.

A fifth theory will enter the picture when the engineer for a combined group of more than 40 foundries will go to Milwaukee about May 1 to inspect a wet tower installation of Modern Foundry Equipment Co. The foundries have combined both financial and "know-how" resources for experimentation in their common problem.

Whiting Has Hope

Theories presently being examined here are wet wash, electric precipitation, baghouse and closed cupola. The latter would require the additional installation of one of the other pieces of equipment in all probability.

Foundries find little trouble in getting equipment which will knock down the visible impurities but the fine particulate matter, which must be caught to meet regulations, and the disposal of accumulated tars, pitches, and resins remain unsolved problems.

Baghouses Favored

Whiting Corp. is working with General Metals Corp. in the design of a water wash installation which the equipment company feels eventually will solve the problem economically. Engineers are pushing a program which they hope will develop satisfactorily within the next few weeks.

The combined foundry group has been building and rebuilding electric precipitation equipment with the aid of Western precipitation experts working at Compton Foundry. Tests thus far have not met legal specifications.

Officials of the Los Angeles County Air Pollution group are said to favor baghouse installations. Baghouses have been found to clean the air in some cases.

Others Face Problem

Biggest difficulties for foundries in this line are in designing a baghouse which will work over a long period. Water condensation during idle hours of the cupola and the damaging accumulation of tars, pitches and resins in the bag, ruin efficiency of equipment tried. With the baghouse, water cooling would be needed to cut the temperatures below 400 to 500 degrees with a glass bag and 300 degrees with a wool bag.

Many experiments have been conducted with a closed cupola and it is known to help limit the volume of discharge handled. It

still needs other collection devices for eliminating fine particulate matter. The collection of resins, which are not as likely to be dissipated by secondary burning in this method, again proves a problem here.

May 22 is the new deadline for action set by the county.

Pacific Coast cities other than Los Angeles are likewise facing the air pollution problem although none of them have an enforcement agency. Under the auspices of the San Francisco Bay Area Council an air pollution committee has been formed of industrialists, county officials, federal government officials and health officers to explore the situation and determine what measures are essential to prevent a serious air pollution condition.

Portland, Ore., has under consideration a proposed ordinance which is as yet only in the formative stage. City Engineer R. W. Finke has urged the Seattle, Wash., City Council to pass a comprehensive ordinance designed to alleviate smoke conditions. Here, too, a study is being made of an air pollution control ordinance.

Construction Record Set

Los Angeles—An all-time high for housing and commercial construction was set in building permit figures for Los Angeles County during March. Permits for homes, business and industrial structures totaled $106,895,261. The best previous month was in August, 1948, with a total of $101,027,882.

During the first three months of this year, a 37 pct increase has been registered over last year. The 1950 total is $223,519,926.

Bethlehem Issues Film

Los Angeles—Adding another to its stock of motion pictures, Bethlehem Pacific Coast Steel Corp. has announced issuance of a film, "Fifteen Minutes with Bethlehem Steel." The film is available for distribution from the company's offices in Los Angeles, San Francisco, Portland and Seattle.

Keokuk's Wenatchee Div. Reopens Redesigned War Plant

Seattle—Wenatchee Division of Keokuk Electro-Metals Co. at Rock Island in eastern Washington resumed operations last month in a completely redesigned plant, after having been shut down for almost nine months.

The plant, an outgrowth of the war, has been producing high grade ferrosilicon for the industry, both locally and for the eastern market.

Operates at 75 Pct

A million and one half dollars have gone into the redesign work for a plant that was purchased for $382,000 at the end of the war. The money went principally into electrical and mechanical equipment.

These design and equipment changes are said to make the plant 100 pct efficient in the use of electric power. In wartime the ferroalloys plant was operated at 75 pct electrical efficiency.

Seventy-five men are employed at the plant, and there will be a round-the-clock operation at the two-furnace facility.

West Coast Market

All silvery pig iron coming off the production line will be processed from ore from Buckhorn Mountain in Okanogan, Wash. The company mine is near Oroville, Wash. The main ore body of Keokuk's Buckhorn Mountain mine was uncovered in December, 1949, after a year and a half of exploratory work. Seven hundred feet of tunnels, both horizontal and vertical, have been drilled in company holdings there.

Buckhorn ore is expected to run 60 to 65 pct iron and will eventually be magnetically separated at the mine site. Approximately 2000 tons of ore already have been magnetically separated at the Rock Island plant and processed into silvery pig iron.

Silicon for the silvery pig also will come from this area. Main market for the Rock Island plant will be California, Washington, Utah and Colorado.

In its earlier stages of operation, Keokuk's plant at Rock Island had to obtain its ore from British Columbia. This meant a truck trip from mine to salt water, where the ore was loaded on barges. It was then taken to Everett, Wash., by barge and reloaded onto rail cars for the trip over the Cascade Mountains—all of which brought the price of the metal up.

Now with the mine in the Buckhorn Mountains, and the magnetic separator at the mine site, there will be a 23-mile trip to the mill with fairly light loads. This road won't be finished until summer, so for the present the ore must come from the mine by rail over a circuitous route.

Vultee Tests New Plane

San Diego—A plane which many think might give new life to the flying boat industry has been flown successfully by Consolidated Vultee Aircraft Corp. at its plant on San Diego Bay.

Built for the Navy, the XP5Y-1 was test flown for the first time to climax years of engineering research work to design a flying boat which was fast and maneuverable and yet sturdy enough to stand the pounding of the sea during landing and take-off. The test plane, which is the world's first turboprop flying boat, is said by Convair to be the fastest airplane of its type yet built with a top speed in excess of 350 mph. It weighs 60 tons but is highly maneuverable.

Anti-Sub Weapon

The flying boat, built to stay away from its home base with a tender for many weeks if necessary, might prove a potent anti-submarine weapon in areas with little landing field area.

Powered by four Allison XR40-A-4 gas turbine engines which combine propeller drive and jet thrust, the new plane will use a total of 22,000 hp on take-off. Each T40 unit swings contra-rotating propellers and develops the equivalent of 5500 shaft hp.

THE FEDERAL VIEW

THIS WEEK IN WASHINGTON

Atomic Energy Commission to continue enlightenment of American industry on its technological progress . . . Sad future seen for Small Business unit

by Eugene J. Hardy

Washington — While much of the work of the Atomic Energy Commission, notably that pertaining to weapons will always be surrounded by extreme secrecy, the Commission continues its efforts to make available to American industry the fruits of its technology.

Metallurgy Test Field

AEC has long recognized the need for a more definitive policy regarding the declassification and release of information having industrial value.

Last summer the first steps in this direction were taken. An advisory committee on technological information for industry was established. Its members were editors of technical publications and representatives of professional societies. (THE IRON AGE, Aug. 11, 1949, p. 112.)

No Great Store Found

This committee was to undertake a test program limited to the field of metallurgy by examining declassifiable and potentially declassifiable material in the files of the Commission. If the test program proved successful, the Commission planned to extend it to fields other than metallurgy.

The first step taken by the advisory committee was to appoint a smaller working party to conduct the actual examination of Commission material limited to patent files of the Commission and consisting of a detailed review, earlier this year, of a large representative sample of the AEC patent files pertaining to metallurgy.

The working party has reported that it found no great store of unclassified or clearly declassifiable technological information in these files which had not been declassified and which would be of great usefulness to American industry.

Another Method Proposed

There were a number of items in the patent files, however, which were deemed of sufficient interest to warrant recommendations for release of the material. These covered such fields as corrosion, melting and casting practices, refractories, electrodes, welding and brazing, powder metallurgy, die casting and electronics.

Despite this not too encouraging start the working party reported to the Commission that "the test program has been of sufficient benefit in its present form so that it should be continued and amplified."

It recommended that another line of attack be pursued, involving going into detailed operating and process reports of the Commission as well as reports from industrial contractors on technology not directly related to the weapons program. Observation of the actual operation of a typical sample of AEC's technological facilities and conferences with personnel responsible for the operation was also recommended.

The operation selected was the electromagnetic separation of isotopes, a purely non-weapons project. With minor modifications these recommendations were approved by the Commission and this phase of the work will begin on May 4.

The Commission also plans to employ a technical liaison editor to interpret technological advances for the technical press—the result of another recommendation from the working party.

Thus, any non-secret information in AEC files which is useful to industry might soon begin to see the light of day.

Proven Champions of Small Business Snubbed for New Group

There's a growing feeling among Congressmen who are really interested in the problems of small business that the recently-created Senate Small Business Committee is going to be a complete "bust."

To support this contention, they point to what they call the "second-string" membership of the new committee. Vice-President Barkley, in naming the 13 members of the new group, deliberately overlooked such proven champions of small-business problems as Senators Murray, D., Mont., and Wherry, R., Nebr., both of whom had previously served as chairman of this group.

The New Line-up

At any rate, here's the line-up of the committee: Senators Sparkman, Ala. (chairman); McFarland, Ariz.; O'Conor, Md.; Long, La.; Gilette, Ia.; Humphrey, Minn.; Hunt, Wyo.; Benton, Conn.; all Democrats; and Tobey, N. H.; Saltonstall, Mass.; Thye, Minn.; Hendrickson, N. J., and Schoeppel, Kan., all Republicans.

It's likely that many weeks will pass before the new committee gets down to brass tacks in giving a definite helping hand to small business. The Senate has yet to vote any funds for the group. In fact, the Senate Rules Committee has not yet indicated it will okay any funds.

Excise Tax Cut Disagreement Hampers Broad Tax Legislation

The outlook for broad tax legislation during the current session of Congress continues to be clouded by disagreement over the extent to which war-time excise taxes should be cut.

Truman Veto Threat

That excises will be cut substantially is almost a dead certainty. The prospects are that Congress will at least slash all excise levies to pre-war levels, except those on gasoline, tobacco and liquor. This would mean a revenue loss approaching $1.5 billion or more than double that recommended by President Truman.

However, the exact extent of the excise cuts as well as the possibility of tax boosts to compensate for the loss in revenue, the latter a Presidential recommendation, appears to hinge on Congressional action on appropriations.

If Congress is able to slash as much as $2 billion from the appropriations measures, the excise cuts will probably be pushed through without any compensating increase in revenue by means of tax increases in other fields despite the President's statement that he would veto any such measure.

On the other hand, if appropriations are not cut to any substantial degree, and the outlook for this is not good, then the Ways and Means Committee will undoubtedly come up with new tax proposals.

Tax on Dividends?

Then, too, there is a definite feeling among some members of Congress that some of the lost revenue must be made up so that the tax bill will be palatable to at least two-thirds of the membership so that a possible White House veto could be overridden.

High on the list of prospects for revenue-boosting measures is the proposal which would require corporations to withhold 10 pct of dividend payments to stockholders, following the same procedure as on wage and salary payments.

Also included on this list would be higher estate and gift taxes and taxation of businesses operated by non-profit trusts and charitable organizations. Taxation of business activities of unions and cooperatives will get a cold shoulder, as will the White House recommendations for a slash in depletion allowances for the mining and petroleum industries.

Mills Plan a "Phoney"

An outside possibility is an increase of 2 percentage points in the corporate tax rate. The phoney Mills plan which would speed up payments of corporate income taxes so as to minimize the prospective $5 billion plus Federal deficit will get a lot of support, but is not likely to wind up in the completed tax bill.

THE BULL OF THE WOODS — By J. R. Williams

IRON AGE
Special Report

DEPRECIATION RULES

CURB INDUSTRIAL PROGRESS

The strength of America lies in a host of things, not the least of which is its ability to produce more goods per manhour worked than any other nation on the face of the earth. Constant improvement in plant and equipment have made that possible. America's future rests on proper timing and financing of replacements for this equipment as it wears out or becomes obsolete.

By GEORGE F. SULLIVAN
Managing Editor
THE IRON AGE

THE future of America's metalworking and metal producing industries hinges on realistic handling of the problems of depreciation and obsolescence.

The job of keeping plant and equipment efficient is harder than ever today because of three things: (1) The usual depreciation reserves are too small because of postwar price increases; (2) Federal tax policy discourages replacement until the last dog is hung; and (3) industry in general has a hit or miss approach to the problem of obsolescence.

Just because America now has more cars, telephones, refrigerators, bathtubs and television sets is no guarantee that it will continue to enjoy an ever increasing standard of living. We have these things because we are more productive, because American workers turn out more goods per

manhour than the workers of any other nation in the world. This they do because they have the tools, the most efficient tools and more of them.

Great Britain was once in our position. The industrial revolution started there. For years she led the world in manufacturing volume and productivity. But management and labor got complacent. Management took every penny it could get in profits and set up trusts to stifle competition, the mainspring of progress. British labor also fought technological change. Now the American miner (when he works) produces six times as much coal a day as his impoverished British cousin. Mechanization is the difference.

America still has the seeds of progress: Competition is rampant; there is a strong disposition to plough back profits for improvements; and labor has not blocked technological improvements except in isolated cases.

Why worry then? Because a situation exists today that threatens the health and the future of the American industrial machine. For the reasons listed above that machine is not being modernized and kept at top efficiency. As a threat to our standard of living it is distressing. To a nation fighting a war that may turn from cold to hot at any time it is worse than that. It is alarming.

Price Level Poses Problem

The problem, oversimplified, is this: Because of rising prices, replacement equipment costs two to five times its original cost. High income taxes and low depreciation credits for tax purposes make it hard to get money for replacements. On top of this, many companies admittedly have no regular scientific way of finding out when equipment is obsolete.

Industry can do little or nothing about the current price level. Some economists see a leveling off for the immediate future but few predict a definite downtrend. The accompanying table shows the higher costs faced by U. S. Steel Corp. for replacement of its facilities. The corporation spent $875.1 million between Sept. 30, 1945 and Dec. 31, 1949 on new facilities. It got $466.8 million of this from its normal depreciation reserve plus its accelerated depreciation reserve. Another $220.7 million came from so-called undistributed profits. This still left $187.6 million to be drawn out of other funds. Change the figures and you have the problem faced today by all efficient business management.

In demanding higher dividends, stockholders often ignore the drop in buying power of post-war corporate income, the "overstatement of profits." J. Frank Gaston of the National Industrial Conference Board concluded recently that from the end of the war through 1948 we used up capital equipment that originally cost $33 billion. Had this been entered at what it would cost to replace this equipment, depreciation would have amounted to $50 billion. Using a different basis, Prof. Sumner H. Slichter estimated that corporate profits had been overstated by $16.4 billion in the years 1946-1948. In other words, some $16 billion reported as "profit" was not real profit and was not logically available for dividends.

The steelworkers' union takes a similar attitude in negotiating with U. S. Steel. In referring to the corporation's "inordinate" profits, union spokesmen always add to net income whatever amount is set aside as an added depreciation reserve. Its argument has been that if the government did not allow this extra depreciation for tax purposes it did not belong in the "depreciation" column, it belonged in net profit.

Neither the stockholders nor the unions would have any kick coming if the Treasury recognized the need for some correlation between depreciation reserves and replacement cost. Instead it holds a double barreled shotgun at management's head. One barrel is the Treasury Dept.'s depreciation regulations (Bulletin F) restricting the rate at which equipment can be written off for tax purposes. The other is Section 102 of the tax regulations which slaps a 27½ to 38½ pct tax on any company that does not pay out a large percentage of its profits in dividends. (The assumed figure is usually 70 pct).

It is true that the taxpayer can depreciate machinery faster than standard if he wants to. The standard is the Treasury Dept.'s Bulletin F, which for instance sets the average useful life of machine tools at 20.74 years! (Bulletin F is based on past replacement history. The lag be-

COSTS ARE UP

Items bought by U. S. Steel	Pct Increase 1949 over 1939
Buildings and structures	108
Excavating, foundations and grading	69
Blast furnaces	132
Coke ovens	130
Rolling and tin mills	92
Cranes	105
Machine tools	84
Average experience—all construction	95

M. W. REED
Vice-president, engineering
U. S. Steel Corp.

Washington
Jan. 24, 1950

tween development of new machines and replacement is a drift toward obsolescence like that which almost wrecked England, says the National Machine Tool Builders' Assn.) The taxpayer who wants to use a higher rate of depreciation and get tax credit for it must prove his case to the revenue agents. Even if he wins it will take years and it costs money. So rather than "fight City Hall," most companies go along with the outmoded government figures.

Obsolescence, the study of replacing equipment regardless of its age because of the advent of more efficient equipment, is tied in with taxes and high prices but needs separate attention. Studies have often shown that it will pay to replace a 4 or 5 year old machine because a new one will be more profitable—despite the high cost of the new one and the fact that inadequate de-

preciation has been charged against the machine it replaces. "It's a major weakness of U. S. industry that the financial side of management is reluctant to accept obsolescence as an operating actuality," says Joseph L. Trecker, executive vice-president, Kearney & Trecker Corp.

More proof of this comes from a survey made by the Machinery & Allied Products Institute. Scarcely more than a quarter of the capital equipment manufacturers responding had an engineer specializing in replacement studies. The customers of these manufacturers were little or no better in this respect. Only a third of those replying made any regular periodic review of their equipment situation for improvement or modernization. This situation has not changed much since the survey was made in 1948.

There are two schools of thought on how depreciation accounting should be revised. One favors accelerated depreciation, the other prefers depreciation based on replacement cost. U. S. Steel Corp. tried the latter in 1947 in a bold frontal attack on the problem. In that year it made an added charge of 30 pct of normal depreciation to offset higher replacement costs. Following detailed cost studies and further cost increases the extra depreciation charge was boosted to 60 pct, effective Jan. 1, 1948.

Other Attacks on the Problem

The American Institute of Accountants opposed this method. The Securities & Exchange Commission agreed with the institute. U. S. Steel therefore switched from replacement cost depreciation to accelerated depreciation. The latter, still in use, makes an extra depreciation charge on the cost of postwar facilities during the first 2 years of their lives. The charge is 10 pct during the year in which the money was spent and 10 pct the next year. This amounted to $22 million last year and $55 million in 1948. No acceleration is made at an operating rate of 70 pct of capacity or less. The accelerated depreciation is in addition to normal depreciation on the facilities but total depreciation over their expected lives will not exceed the cost of the facilities. The accelerated depreciation is not now deductible for income tax purposes.

Many other companies earmark extra funds for the depreciation account, basing the amount on how much they need to set aside and how much they can afford, in view of the lack of tax credit. In the financial report of many well run companies there often appears the statement: "Because allowable depreciation is inadequate in view of current costs your company has set aside an additional . . ." But in the national picture this is not enough for two reasons: (1) Not all companies do this; and (2) those that do so pay through the nose for their foresight. In other words, the Treasury taxes as profits some of the money set aside for new equipment—which new equipment will itself make more money for the company, and hence more taxes for the government.

Proposals Worth Considering

The National Machine Tool Builders' Assn. urges that management be given the right to fix its own depreciation schedules as long as it follows a consistent policy from year to year. If a manufacturer depreciates his machinery rapidly he will pay less taxes in the early years but higher taxes after he has recovered the cost of the machine. If he spreads the depreciation over a long period the Treasury will get more taxes in the immediate present.

If tax rates stay the same or rise the Treasury cannot lose. It will actually gain because the more modernly equipped business will be more efficient and prosperous. The net return to the government will be greater as the years go on. The machine tool builders recommend this not

as a stop-gap but as a permanent national policy.

Frederick S. Blackall, Jr., president and treasurer, Taft-Pierce Mfg. Co., points to the accelerated depreciation (5-year amortization) permitted during the war to show the electrifying effect of liberalized depreciation policy on capital investment. And he notes that Hitler permitted complete amortization of machinery during the first year of its life when he was building up his industrial potential for war.

Mr. Blackall is careful to point out that just because a firm had the right to depreciate equipment rapidly did not mean it had to do so. Given the right to choose their own period some firms might not change. If complete freedom cannot be had in selecting the period, then he urges that at least the depreciation floor should not be higher than 5 years. It should be less, he suggests, if the taxpayer can prove that his equipment life is shorter. (In automotive tools and dies, 2-year amortization is legal for tax purposes).

Adm. Ben Moreell, chairman of the board and president, Jones & Laughlin Steel Corp., suggests that the federal tax laws be changed to allow companies to write off up to one-half of equipment costs within 1 to 5 years, as they choose, and that they be allowed to deduct this amortization from taxable income. He proposed that the limit on amortization deducted in any one year be set at one-half the taxable income for that year before the amortization is deducted. In a year in which Jones & Laughlin spent heavily for plant and equipment, the Moreell proposal would have cut both taxes and profit, but total cash would have been increased by the amount of the tax reduction. The government would not lose in the long run by deferring the payment, the Admiral noted. Instead, Uncle Sam would gain because this encouragement to spend for new plants would produce more goods and more money for taxes.

How Others Do It

Other nations have recognized the direct connection between liberalized depreciation and the national welfare. In his 1949 budget message, Sir Stafford Cripps, Chancellor of the Exchequer, proposed for socialistic Britain that the first year depreciation allowance of 20 pct of the new cost of plant and machinery be doubled on equipment bought after Apr. 6, 1949, making it 40 pct of the new cost. The Soviet Union has switched from a policy of letting the state finance replacement out of general funds—under which plant and machines deteriorated—to one of providing a specific sinking fund for the purpose.

Socialistic Sweden permits a manufacturer to determine his own depreciation period. France has an accelerated system which permits higher depreciation based on the number of hours machinery operates; it is 30 pct a year if the machine runs 6000 hr a year. In Canada almost half (48.8 pct) of the cost is recovered in the first 3 years. In Australia initial depreciation is 20 pct on equipment bought between July 1, 1946 and June 30, 1951.

Scores Hit or Miss Methods

Because it found that so few businessmen used a scientific approach to equipment replacement, the Machinery & Allied Products Institute has published a handbook on the subject. The "MAPI Replacement Manual" asks and answers such questions as: "What equipment in your plant is economically replaceable? What is it costing the company not to make the indicated replacements? Do you have any organizational setup to keep you informed on replacement opportunities?" It scores the rule-of-thumb method of deciding on replacing equipment. Instead of shooting blind, it outlines specific practical methods for deciding whether or not a machine should be replaced by a newer model.

The MAPI manual bypasses the question of age. It would just be a useless 70-page book if all machinery were operated until it wore out—if new equipment were not constantly coming onto the market to do the same job better at less cost. How much less cost, if any, is a key question that can be answered by the techniques outlined in the manual.

An IRON AGE survey made in 1947 which drew replies from 560 metalworking plants showed a wide variation in machine pay-for-itself time. Some wanted machines to pay for themselves in a year, some would wait as long as ten. Many probably used hit or miss methods to estimate the

"Accelerated depreciation will contribute more to increase production than anything else in face of the present tax problems. Accelerated depreciation will make it possible for industry to continue building up its productive capacity. This would take care of: Added revenue . . . enable small business to grow and would not hurt large business . . . increase employment . . . stabilize tendencies toward inflation . . . enable small business to finance itself much easier . . . build up our production so we could compete in international markets without tariff. . . ."

ROSS STEWART
Small Business Advisory Committee
U. S. Dept. of Commerce

Washington
Dec. 6, 1949

"Business, large and small, must be encouraged by the Government to expand their plants and to replace their obsolete or worn out equipment with new equipment . . . the rate of depreciation on these new plants and facilities for tax purposes should be accelerated. That means more jobs for the worker, increased profits for the businessman, and lower cost to the consumer."

Chicago
Oct. 28, 1944

FRANKLIN D. ROOSEVELT
In an address to the nation

time because it would depend on a specific new machine v. a specific existing machine. But 60 pct of them would buy more machine tools if tax treatment of depreciation were liberalized. And 72 pct favored a higher rate of write-off.

Congressional Action in Doubt

In spite of Franklin D. Roosevelt's espousal of liberalized depreciation (see accompanying box) the Truman administration is opposed to any such legislation now. Treasury Secretary Snyder has said so. Consideration by the Democratic-controlled Congress of accelerated depreciation legislation would be a reversal of what its leaders have been saying on tax matters. They want more revenue now. The fact that there would be no difference in revenue in the long run apparently cuts no Congressional ice.

The situation recalls the opposition to Beardsley Ruml's pay-as-you-go income tax proposal. It was just too simple; the apparent loss of a whole year's income taxes stalled the idea for months. Similarly, the certainty that some form of accelerated depreciation would bring out more risk capital and lead to installation of more machinery in the near future is not sinking in. That the result would be more productivity and hence more income to tax in the future is apparently overbalanced by the certainty of some immediate loss in tax revenue.

Unless their thinking can be changed, neither of the tax writing committees of Congress (the House Ways and Means Committee and the Senate Finance Committee) are likely to report out any liberalized depreciation bills this year.

According to A. G. Bryant, vice-president, Cleereman Machine Tool Co., who addressed the National Machine Tool Builders last fall, there is too much complacency on the matter in industry. "We have heard so much about this subject that we just take it for granted that everybody understands it as we do. Nothing could be further from the truth. As a matter of fact, the two men most responsible for Treasury Dept. policy in this matter sit calmly by and say, 'We see no reasons for taking any steps at all . . . We have no widespread complaint. We hear from MAPI; we hear from your organization; we hear from a few others; we understand that some members of Congress are getting excited about the subject; but we see no reason for change.'"

It took the oleomargarine manufacturers a couple of decades to lick the butter lobby. They had the full, but utterly silent, support of the American housewife for years and years. Finally the housewives woke up and told their Congressman to snap to it. And so, despite the potent dairy lobby, the margarine makers (and the housewives) won.

There is no anti-depreciation lobby. Only apathy.

NEW BOOKS

"Internal Auditing in Industry," edited by V. Z. Brink and B. Cadmus. The various chapters outline the specialized internal control and internal auditing problems of a number of representative industries. Intended for readers familiar with the normal techniques, the book is concerned with special and unusual requirements of the subject industries. The Institute of Internal Auditors, 120 Wall St., New York 5. $5.00. 404 p.

"Iron Bearing Deposits in Washington, Oregon and Idaho," by Carl Zapffe. One of a series of reports prepared for Raw Materials Survey, the book gives a comprehensive review of the quantities and types of ores found in the Pacific Northwest, from the standpoint of their suitability for establishment of large-scale steelmaking and fabricating industries in that region. Raw Materials Survey, 701 Woodlark Bldg., Portland 5, Ore. $2.50. 94 p.

Openhearth and Report Latest

OXYGEN jet fired openhearths, new mold coatings, furnace practice, utilization of low-grade ore and coke oven maintenance were featured at the 33rd joint conference of the National Open Hearth Steel Committee and the Blast Furnace, Coke Oven and Raw Material Committee, AIME, held in Cincinnati, April 10 to 13. Over 1200 of the men who engineer and operate the smelting and refining furnaces attended the conference. Over 400 registrants took the tour through the Armco Steel Corp.'s plant at Middletown, Ohio, the first day of the meeting.

One highlight of the technical program of the openhearth groups was the annual McKune Award paper, "The Effect of Hot Metal on Openhearth Production," delivered by W. A. Greene, metallurgical engineer, Kaiser Steel Co., Fontana works. Oxygen is now a hardy perennial at steel meetings and the Tuesday morning openhearth session on the production and use of oxygen was another attraction. Faster charging methods, including plans of Armco's new openhearth shop were presented. Tar, long a popular, cheap mold coating is on the way out because of pressure from the union and the law in the form of dirt ordinances. New mold coatings are a must and two papers were presented.

The blast furnace meetings centered about ore and agglomerating or concentrating methods used on ore bearing fines. World ore resources were detailed by Professor J. W. Gruner of the University of Minnesota. Mr. Tigerschoild, director of research and P. E. Ilmoni, research fellow, Jernkontoret, Stockholm, discussed, "Factors Influencing the Strength of Green and Burned Pellets Made From Fine Magnetic Ore Concentrates." Before this same group, P. E. Cavanaugh, assistant director, department of engineering and metallurgy, Ontario Research Foundation, Toronto, gave a paper, "Pelletizing of Iron Bearing Fines by Extrusion." Cost comparisons showed that this method is cheaper than other methods of agglomeration currently in use.

Those in attendance took a short break from technical affairs Tuesday evening when W. W. Sebald, president, Armco Steel Corp., spoke at the annual fellowship dinner.

The presence of manganese in iron was declared not to be essential to the removal of sulfur in smelting operations, by W. A. Greene, in his McKune Award paper. Mr. Greene presented data gathered from over 1100 openhearth heats in which the sulfur ranged from 0.030 to 0.045, and carbon from 0.07 to 0.35. Results of multiple correlation studies used to determine the effect of manganese showed that this variable had no effect on the rate of sulfur removal within a manganese range of 0.10 to 0.60.

Residual manganese in the steel in the openhearth furnaces was studied on a cost basis. A gain of 0.04 residual manganese, using 0.10 manganese as base, cost 43¢ per net ton of steel. A total gain of 0.07 manganese cost 78¢ per net ton of steel when this residual is produced by adding manganese ore to the blast furnace in order to supply higher manganese hot metal to the steel units. A similar study was presented on the cost of contained manganese in the iron by this same method.

Sulfur Headaches

Longer openhearth heat times on high sulfur charges are due to a large extent because the flush slag carries off very little sulfur. The reasons for sulfur troubles which have always plagued the steelmaker were touched on. Recently the sulfur problem has increased and many methods of elimination are being tried. But, according to the McKune Award paper, it is not economical to attempt to reduce sulfur merely by adding manganese to the iron.

The oxygen session following Mr. Greene's paper generated a lot of interest and lively discussions from the floor. E. G. Hickling, works manager, Linde Air Products Co., New York, led off with a paper on oxygen production. The type of process and size of oxygen plant depends on the demand rate, the purity wanted and the variation in demand or peak load factor. High purity, 99.5 pct O_2, is being produced at half the price it was 20 years ago. Mr. Hickling reported that low purity, 95 pct O_2, can be made cheaply in a process which consumes one million or more cu ft per hour with mechanical purification methods.

A. E. Reinhard, superintendent steel production, Great Lakes Steel Corp., Detroit, brought oxygen practice up to date in his paper, "Oxygen Jets Through the Openhearth Backwall." Great Lakes uses oxygen for decarburization only and feeds the gas into the furnace by two jets mounted through the back wall. The jets are inserted through two water cooled ports which are opposite charging doors Nos. 2 and 4.

Blast Furnace Operators Developments

Oxygen of 99.5 pct purity is fed through a 1¼ in. line. The jets are cooled with a 2-in. diam water line.

Two jet booms, 20-ft long, made from 4½-in. OD tubing hang out over the pouring floor, as shown in Fig. 1. Some shops would have difficulty with this setup because of the lack of space

FIG. 1—One of the two jet booms used by Great Lakes shown protruding from the back wall of the furnace. The booms are electrically operated and supply 30,000 cu ft of O_2 per hr to the bath. A similar boom is located on the far side of the furnace beyond the building column.

behind the furnace. A replaceable copper nozzle is attached to the end placed in the furnace. A single hole 17/32 in. in diam is drilled in the nozzle as shown, in Fig. 2. Great Lakes uses 30,000 cu ft per hour of oxygen at 140 to 160 psi.

The complete boom and jet mechanism is electrically controlled from a panel at the rear of the furnace or at the first helper's board at the front of the furnace. The jet angles through the back wall at 15° pointing toward the middle of the burner and is retracted from the furnace when not in use. The jet points down toward the furnace bottom so that the oxygen stream strikes the bath at a 60° angle from horizontal. The jet nozzle operates at a height of 6 to 8 in. above the slag and directs the oxygen to the slag metal interface where the required decarburization action takes place.

The practice at Great Lakes is to start the oxygen jet after part of the lime is in solution. No excessive foaming or splashing is encountered. Roof and furnace life has not been deleteriously affected. Usually heats are tapped 30 min after oxygen is started. By this time proper tap temperature is also attained. The carbon level at the time oxygen is started is around 0.30 to 0.40. In cases feed ore is used in conjunction with the oxygen jet. About 45 cu ft of oxygen per net ton of ingots is consumed. The rate of carbon drop can be closely controlled. With two jets each delivering 30,000 cu ft per min, carbon drop averages 0.01 per min.

In some furnaces which have small checker areas and deep baths oxygen has increased steel production appreciably. The heat time at one plant, from 0.30 C to tap, has been cut in half through the use of oxygen. Oxygen has proved to be better than compressed air for decarburization. However, at high rates of flow compressed air was as good as oxygen but excessive roof erosion occurred. Another plant, which works on a cold charge, reported that the use of oxygen has increased their tons per hour by 10 pct.

One reason that the oxygen lance has been replaced with the jet is that in many cases the lance turned each openhearth into a bessemer as far as fumes were concerned. This often brought objections from the neighborhood in which the mill was located, the workmen, and in cases where dirt ordinances exist use of the lance even attracted the attention of the gendarmes. In one case, the gentlemen with the smoke charts were somewhat responsible for the oxygen practice being discontinued for a while until dirt and dust collectors could be built. Many plants are faced with this new type of regulation.

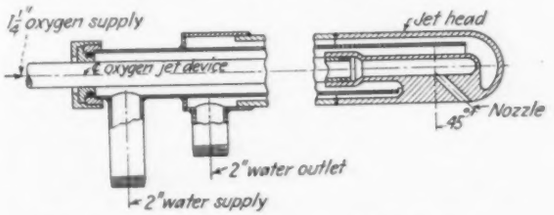


FIG. 2—A water-cooled copper jet head with one 17/32-in. hole operates 6 to 8 in. above the bath and directs oxygen to the slag melt interface.

Paul Nutting, openhearth practice foreman, Inland Steel Co., East Chicago, reported on the oxygen survey recently conducted by the steel committee. Questionnaires were sent to 30 plants using oxygen. Of the 20 plants which answered in full, 40 pct reported they use oxygen for decarburization purposes only. One plant is using the gas for flame enrichment only, and three plants are employing oxygen for both decarburization and combustion.

The oxygen plants report that they have not

had to change their charging practice to any important extent. Fuels of all types are being burned in oxygen furnaces with oil predominant and coke oven gas in second place. All but one plant is using 99.5 pct O_2. Fume troubles were generally experienced by all shops, particularly when oxygen is used on high carbon heats. No fumes result in the flame enrichment application.

Although the biggest gain in steel production can be secured by using oxygen for combustion, the widest use to date is in decarburizing. Table I summarizes the committee's findings on the two methods. The reason the decarburization practice is more popular is that the combustion use of oxygen takes more gas per ton and increases cost. It costs 20 to 25¢ per net ton to use oxygen through the regular burners as a flame enrichment agent. Also, combustion use of oxygen requires special scrap charging facilities. Such furnaces must be charged fast or the time saved in meltdown is lost.

TABLE I

USE OF OXYGEN INCREASES PRODUCTION

Rate of Flow, Cfm	Consumption of Oxygen, Cu Ft per net ton	Fuel Saved, Btu per net ton	Increased Production Charge to Tap, net tons per hr
By Decarburization			
548	89	176,000	0.45
By Combustion			
275	325	362,000	1.45
Combination Decarburizing and Combustion			
		350,000	1.95

Widespread use of oxygen in melting has brought some new problems to the industry. Refractory life has not been up to standards in many cases. Faster heat times have meant faster methods of scrap preparation, loading and charging. Vernon Jones, openhearth superintendent, Armco Steel Corp., Middletown, gave a paper on this subject at the second basic operating session. The layout of Armco's new three furnace shop was shown.

The buggies will be charged on the ground level, stored on tracks and then pulled at large openings in the charging floor when needed. These holes are at either side of each furnace. At this pit the buggy will be taken up to the floor by hydraulic lifts, placed on tracks at the corner of the furnace and charged by one of the two charging machines. Empty buggies are pushed across to the other end of the same furnace where they are lowered through another hole back to the ground level. This system will permit fast charging without one furnace interfering with its neighbor. It was predicted that fewer bank delays will occur under the new system. An estimate of one buggy charged every 2 min was made for this practice.

One of the knottiest problems facing the steelmakers is that of mold coatings. Tar has long been used and is cheap and efficient in providing good ingot surfaces. New coatings must be found as U. S. Steel Corp. has been given to July by the union to find a substitute. Other companies are expecting to have to meet similar deadlines. The unions objection to the tar fumes and smoke and possible violation of dirt ordinances is another factor which means that tarred molds will soon be out.

Two New Coatings

The steelmakers have tried about every conceivable material as a mold coating. These include molasses, salt water, sugar, starch, aluminum and others. Mold coatings are essential as a good coat prevents the formation of scabs on ingot surfaces caused by splashing or surging when the molten ingot is poured. Two interesting papers were presented on this subject, one by Harold Walker of Republic Steel and the other written by John Golden, superintendent of steel production, Carnegie-Illinois Steel Corp., Gary. In general, the new coatings require that mold temperature be lower for successful coating. Mr. Walker reported a range of 350 to 400°F as an optimum mold temperature for the new materials.

Mr. Golden's paper reported results of two new mold coatings, Darmold and Hydropaste. No fumes are given off by these compounds. Darmold is a colloidal graphite solution while Hydropaste consists of fine aluminum plus a binder. Many present tar dipping or spraying devices will have to be changed to handle the new materials.

So far the new coatings have not proved as good as tar in both performance and cost. In semikilled grades, however, under 0.30 C Darmold has proved better than tar at the Gary works as far as ingot surface is concerned. Darmold costs about five times as much as tar. Hydropaste is only three and a half times as expensive as tar but this coating requires special mixing equipment.

While the steel men were delving into their problems, the operators who supply the iron to the steel furnaces were equally engrossed. The blast furnace section opened Tuesday's technical session with, "An Appraisal of the Iron Ore Reserves of the World—An American Estimate," by J. W. Gruner, Professor of Geology and Minerology, University of Minnesota. Prof. Gruner covered the subject by area and types of ore for all the important fields, including Russia.

The Lake Superior Reserves are listed in Table II. Of the Mesabi ores 350 million tons are underground. Last year 26 pct of the Mesabi

TABLE II

SUPERIOR IRON ORE RESERVES

(millions of gross tons)

Mesabi (minus low grade oxidized ores)	1100
Cuyuna and Vermilion	60
Michigan	480
Wisconsin	6
Total	1646

(To date Lake Superior has produced 2560 gross tons of ore)

ore shipped was in some way beneficiated. Professor Gruner's estimate of the worlds important iron ore reserves are listed Table III.

Estimates of origin and quantity of ore to be used in 1960 in this country are given in Table IV.

Papers on agglomerating of iron bearing fines included a new method of pelletizing by vacuum extrusion. This paper, given by P. E. Cavanaugh, produces pellets suitable for openhearth feed or blast furnace reductions. The vacuum extrusion machine provides a simple, cheap method of pelletizing all types of ores, both swelling and nonswelling types. The pellets can be charged in the air dried condition and do not require preburning.

Extremely fine material such as taconite concentrates are difficult to sinter cheaply. Pelletizing such materials may prove to cost less than sintering. Fig. 3 is a sketch of the principle steps of the vacuum extrusion process. Commercial sizes of extrusion machines can extrude

TABLE III

ORE RESERVES RUSSIA vs USA

Estimates of Important Fields

Region	Millions of tons*	Percentage of Iron
USA		
Lake Superior region	1646	51
Northeastern USA	800	30 to 35
Southeastern USA	1150+	35
Western USA	300	50 to 60
Steep Rock Lake, Ont., Canada	50+	50 to 55
Michipicoten, Ont., Canada	100	35 to 40
Labrador-Quebec	1000+	50 to 60
Venezuela	1000±	50 to 65
Chile	30+	60 to 65
Brazil	2000+	50 to 65
Liberia, West Africa	30+	60 to 65
	8096+	
Open-pit magnetic taconite concentrates of Mesabi Range	1800	60 to 65
Grand Total	9896+	
USSR		
Krivoy Rog, Ukraine	1000+	50 to 60
Ural Mountains	1250+	45 to 50
Kursk, Central Russia	300+	40 to 60
Tula-Lipetsk, Central Russia	900+	35 to 40
Kertch Peninsula, Crimea	1800±	35 to 40
North Caucasus and Trans-Caucasus	210+	?
Bratski-Ilimski, west of Lake Baikal	400+	?
Novosibirsk-Krasnoyarsk, western Siberia	200±	40 to 60
	6080+	
Probable magnetic iron formation in Kursk and other districts	Many billions of tons	25 to 30

* Plus indicates probably a considerable higher tonnage.

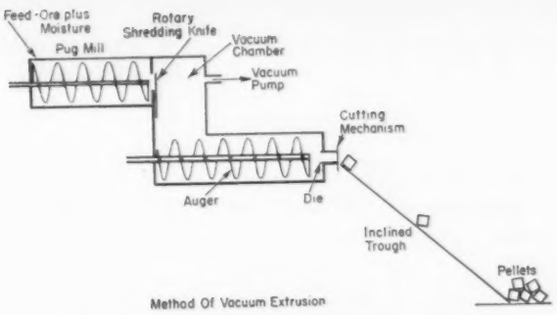


FIG. 3——A schematic diagram of the method of vacuum extrusion developed by the Ontario Research Foundation, Toronto. This method of agglomerating iron bearing fines is thought to be cheaper than other processes now in use.

up to 50 tons of ore per hr. Pellets 3 in. in diam are about the largest practical size that can be made in cubic or cylindrical shapes. Production cost per hour from ore, or mixed ores, which do not require a binder runs close to 33¢ per ton of pellets produced. Production costs for ores using a binder are higher.

On Wednesday morning five papers or case histories were given on the blowing out practice of carbon hearth blast furnaces. Pig practice as well as gas cleaners received the attention. In the gas cleaning session, papers were given by R. E. Touzalin, service engineer, Arthur G. McKee & Co., Cleveland; G. P. Burks, division superintendent, blast furnaces, Carnegie-Illinois Steel Corp., Gary; Harry Johnson, general superintendent, central furnaces and coke works, American Steel & Wire Co., Cleveland, and Owen Rice, metallurgical engineer, Freyn Engineering Co., Chicago.

TABLE IV

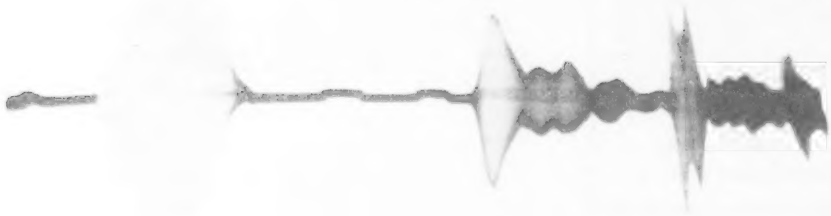
ORE DEMAND—TODAY vs 1960

Origin	1948 (Millions of tons)	1960 (Millions of tons)
Mesabi open-pit, including beneficiated ores	61.9	30
Mesabi underground ores	2.2	6
Mesabi taconite concentrates 63 pct Fe		10
Michigan, Wisconsin and other Minnesota ranges	18.1	21
Michipicoten and Steep Rock Lake (all ores assumed to be used in USA)	1.8*	4
Northeastern states	4.5	8
Southeastern states	8.9	11
Western states	4.4	6
Total from North American producing fields	101.8	96
Labrador-Quebec		8
Venezuela		6
Chile	2.6	2
Other foreign ores	2.5	4
	106.9	116

* 1947 figure; 1948 figure not available.

At the sintering session W. B. Webb, general superintendent and R. G. Fleck, plant superintendent, J & L Ore Co., Star Lake, N. Y., presented "Beneficiation of Adirondack Magnetites." A "Swedish Sinter Practice" was given by A. W. Robinson, John Mohr & Sons Co.

Sonic Tests Spot Flaws



In Heavy Forgings

Sonic testing of irregular shapes demands special techniques and equipment. Certain critical areas on eccentric cranks must be critically scanned for defects. Drill collars are tested with two different types of searching units. Part II of a two-part article.

By ROBERT W. SNOWDON.
Special Engineer
Heppenstall Co., Pittsburgh

DIFFERENT techniques are often required in sonic testing of various shapes. Part I of this article, THE IRON AGE, Apr. 13th, p. 77, covered the testing of die blocks and pinions. This concluding portion explains how to test other types of forgings.

Single throw crank and eccentric shafts, due to their shape, call for some changes in the testing procedure. In the case of the eccentric shaft, the lump of steel forged on it is machined to form an eccentric or the cheeks and pin of the throw. In both cases, the forging procedure is the same. After the billet has received enough work in both directions, the ends are tooled down to form the journals of the shaft. Even though the upsetting operation has broken up the original structure of the ingot and the billet, the grain flow has not been radically changed and is still parallel with the longest dimension.

In the forging operation, fillets are left between the eccentric or the crank, and the journals. This is done to permit the flow of the metal to conform to the shape of the piece and also to reduce the possibilities of failure at these points due to the heat treating of sharp angles. These fillets are later machined out.

In the sonic testing of these crank and eccentric shafts particular attention is given to both ends between the eccentric or crank, and the journal. If any trouble is present, it is usually found in the areas shown in Fig. 13.

Wheels which are machined all over before shipment can be tested around the periphery, testing from the outside diameter to the bore. This is 90° to the hub test and, in some cases, may pick up very small defects in the flange or hub section which lie parallel to the bore. In general, the upsetting operation distorts the original axis of the ingot to the extent that the flow lines along which weaknesses may occur lie either parallel to the machined face of the hub, or close enough to parallel, that they are readily picked up by a test through the hub section.

Fig. 14 shows an etch test from the hub section of a large rejected wheel forging and the oscilloscope photo of the defects.

The drill collar, a very important part of the equipment used in oil well drilling, has been the subject of much discussion and research work in the past few years. In the search for oil, holes have been drilled and are being drilled in the earth to record depths and through extremely hard formations. Deep drilling has required larger drill rigs using more hp, and has resulted in many cases of expensive failures in drill stem parts.

Producers of drill stem parts sincerely believe that in many cases where failures occur, the men in the field can be blamed for mishandling the makeup of the drill string at the rig. The faults in makeup, which might not show up under normal conditions of hp and depth of hole, have become expensive failures in present-day, very deep hole, hard formation drilling. To offset these failures, drilling crews have become more conscious of thread and shoulder damage, are using more and better lubricants, and are keeping a closer control on torque during the makeup.

The problem has been to produce drill collars

Continued

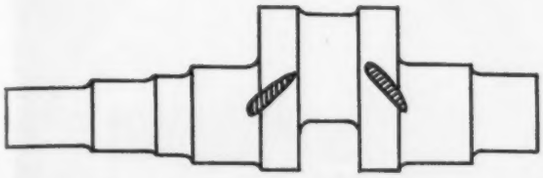


FIG. 13—A single throw crank showing the areas which are given particular attention when testing such shapes.

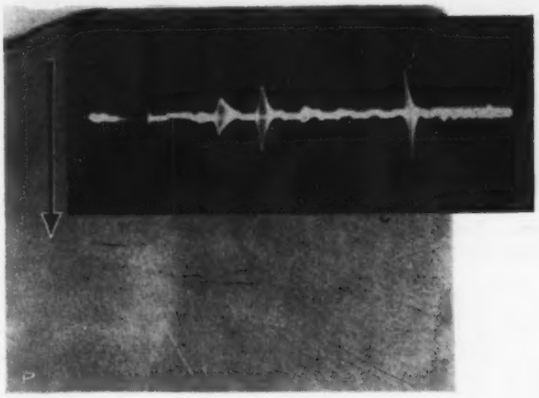


FIG. 14—Defects in a bucket wheel hub and the oscilloscope of the defects.

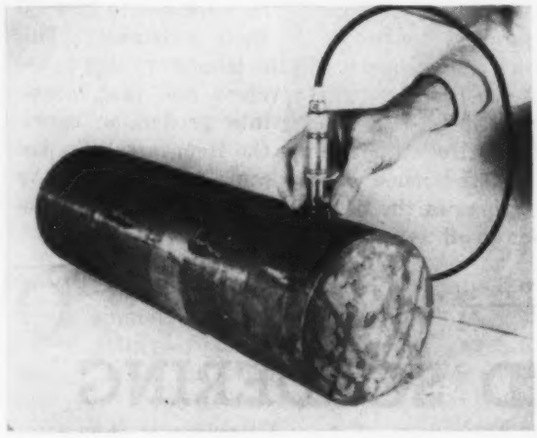


FIG. 15—The 2¼ megacycle, 1-in. straight unit, used in preliminary test of drill collars.

of unquestioned quality to assure good performance during any drilling operation, no matter how deep the hole or how hard the formation. The sonic test has become a very important part of the quality control in the manufacture of these drill collars.

To do the required job, it has been necessary to employ the use of two distinctly different types of searching units on a good surface produced by tungsten carbide tools. The first searching unit used is the standard 1-in. straight unit. This unit is worked on two strips, 90° apart, for the full length of the collar. Fig. 15 shows this unit in use.

This test on the two strips 90° apart, covers a large percentage of the cross-section of the collar due to some fanning of the sound beam. However, the main objective of the test is the location of defects of the type shown in Fig. 16 along the axis.

The angle searching unit, which employs the quartz crystal at an angle and puts out what is known as a shear wave, is used to locate any defects from the surface to depths of approximately 1/3 of the diameter. This angle unit is extremely sensitive and remains so even though the clear plastic contact surface rapidly wears to conform to the radius of the collars. The searching unit as applied to the piece is shown in Fig. 17 and illustrates the radius worn in a unit of this type from use. Fig. 18 shows the approximate path of the sound beam in a round, and the type and location of the defect in this round as picked up by this type of unit.

To test the entire 360° of the surface to the required depth, it is necessary to test only 180°

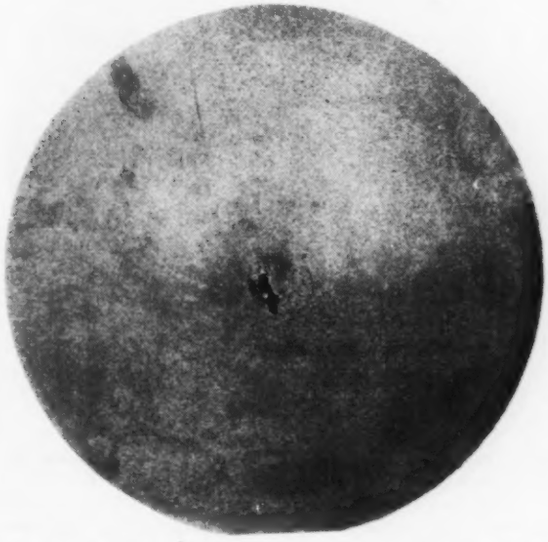


FIG. 16—Typical defect located using 2¼ megacycle straight searching unit on drill collars.

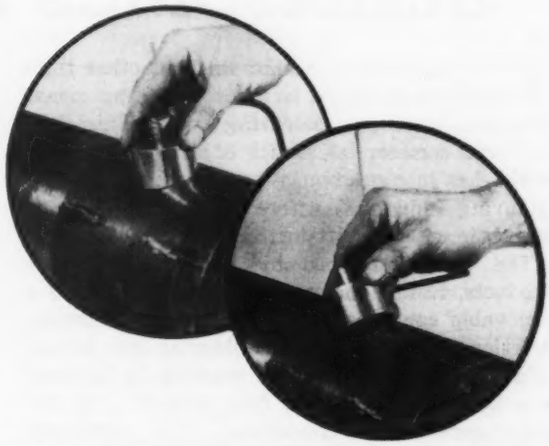


FIG. 17—A 2¼ megacycle angle searching unit used in drill collar tests to locate defects at a depth of approximately 1/3 of the diameter. The bottom illustration shows the radius worn on this unit from use.

of this surface. The accurate location of any indications received is difficult due to the fact that there is no back reflection when this unit is being used. To illustrate the extreme sensitivity of this unit at 2¼ megacycles, Fig. 19 shows an oscilloscope photo of a defect picked up in a drill collar. The defects as shown were within the first 8 in. of one end of a collar. This is in the area which will ultimately be threaded where even the slightest defect cannot be tolerated.

Sonic testing is relatively new. It is not, and never will be, a cure-all in that it has to do with internal soundness only which is but one phase of the inspection process. The successful use of sonic testing depends largely on the reflectoscope operator. For this reason the development of competent reflectoscope operators is most important. Before they become proficient, they must have tested and followed through to destruction many forgings of different shapes and sizes.

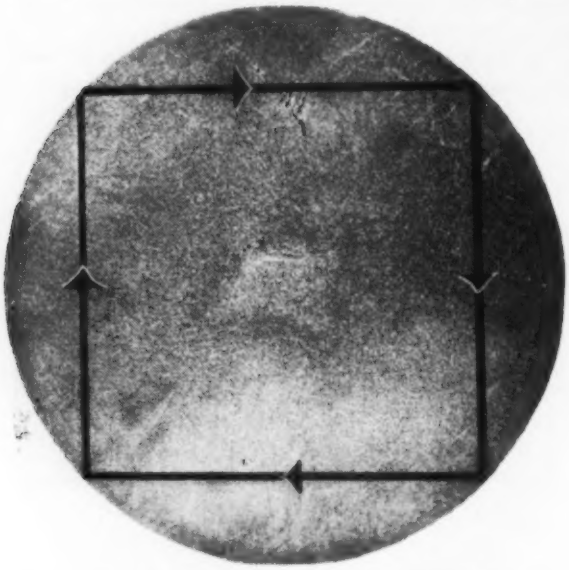


FIG. 18—Approximate path of the sound waves in testing a round with the angle searching unit shown in Fig. 17.

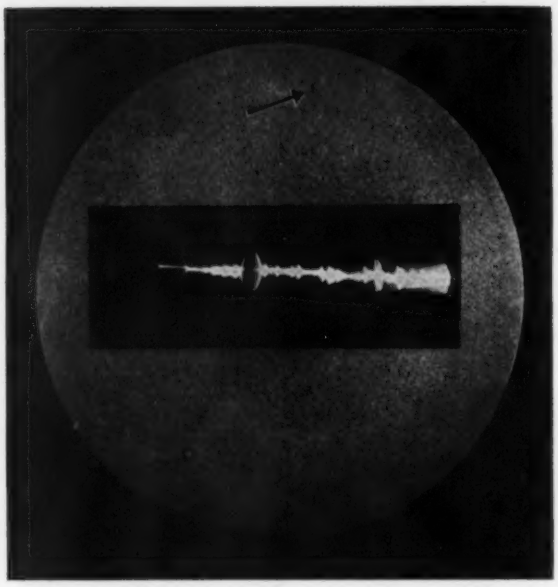


FIG. 19—Small defects picked up in sonic test of a drill collar using the angle searching unit.

It is costly to destroy forgings in order to gain more knowledge of the work and to give the operators confidence in their judgment. This work cannot be done in the laboratory due to the size of the products involved and that, consequently, it cuts deeply into production operations. Notwithstanding, the Heppenstall Co. has pioneered much of the sonic testing of heavy forgings in the belief that it is a real contribution to all users of forgings.

ULTRASONICS AID SOLDERING

THE soldering of aluminum, and other light metals and alloys, is made easier by means of a new ultrasonic soldering iron. This iron, the first commercial model of its kind in the world, has many potential applications in manufacturing industries where successful soldering of light metals is a production problem.

The iron, developed by Mullard Electronic Products, Ltd., London, consists essentially of a removable copper soldering bit and a magnetostriction transducer. The soldering bit, heated by a conventional resistance winding, is fastened to a brass block held in firm contact with the nickel core of the transducer. The ultrasonic power necessary to drive the transducer is supplied by an electronic amplifier comprising the power supply unit.

The iron solves the problem of temporarily destroying the refractory oxide film on most light metals by ultrasonic stimulation. This provides a clean surface and greatly facilitates the soldering of aluminum and other metals.

In addition to its simplicity of operation, the soldering iron has the advantage that no flux is required and that standard soft solders may be used. To avoid electrolytic action, it is advisable to use a solder with a tin-zinc base.

In application, the soldering bit is allowed to heat to the usual operating temperature. The transducer is then energized, and the bit tinned by applying a soft solder. Care should be taken to maintain a good liquid contact between the bit and the work in order to insure maximum acoustic efficiency and good joints.

Quality Control LOWERS COSTS BOOSTS PRODUCTION

Through simple statistical methods, quality can be set at any wanted level. At Willys the control established to maintain this quality is done at a minimum expense of inspection.

By NELSON G. MEAGLEY
Manager, Statistical Quality Control
Willys-Overland Motors, Inc., Toledo

QUALITY control techniques require personnel with statistical know-how. The principal problems, however, are organizational, not statistical. They deal with applying these principals within the framework of an organization. A great many persons contribute to the quality of the product at all levels of management and operations.

The adoption of scientific systems to control quality necessitates new ways of doing old jobs. To be effective the systems must be plant-wide and all persons affected must understand the principals of the program as it applies to them.

The first step in installing quality control is a thorough study of the quality which has been produced by the operation. An examination is made of the inspection records over several previous weeks. If suitable information is not available, then a quality control installation man is assigned to secure the type of data needed.

The inspection records are broken down so as to learn the daily percentage rejections which have been charged as scrap or repairs. A study is made of the type of defects and the probable causes. A set of control charts are then placed on the job as close as possible to the operation causing the scrap or repair.

All control charts at Willys-Overland are used with control limits. Standard quality control practice is followed on all P and C charts which are basic. These charts are simple and are explained in Fig. 1 and Fig. 2. These control lines represent the limits of the natural variability of the process.

When rejections exceed these percentages or numbers they are from an assignable cause, which is an outside cause for rejections, not normally a part of the process. An immediate attempt is made to locate and remove this assignable cause. The same practice is followed on $\bar{X}R$ charts, Fig. 3, except that control limits are not restricted beyond the range required by the specification.

Each inspection interval, such as a day, an inspector plots the P charts so as to show the

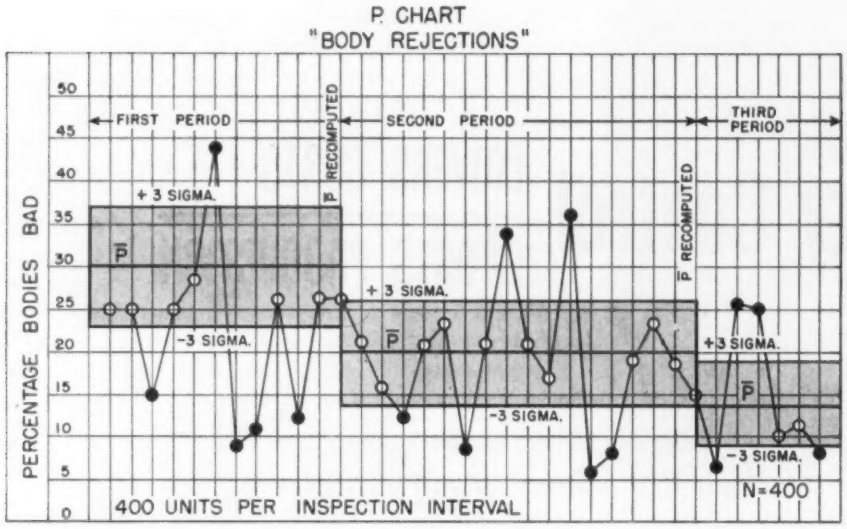


FIG. 1 — This type of char. shows the percentage rejected at each inspection interval. When rejections depart from this previously established normal by 3-Sigma or more the reason can usually be assigned to one cause. Each thirty days a new $\bar{P}$ and control limits are computed based upon the latest data. When assignable causes no longer occur, the $\bar{P}$ indicates the capability of the process and further improvements become difficult, usually requiring a fundamental change in the process.

percentage rejections occurring in the previous period. Often, a considerable improvement occurs immediately following the placing of these charts as they have a beneficial psychological influence where human errors are responsible. After the charts have been in operation for two or three weeks, a series of meetings are held with the production supervision responsible for the job so as to explain the statistical meaning of the charts.

Tool engineers and maintenance people are included in the meeting. After supervision has minimum instructions on the technical nature of statistical control and their relationship to it, the program is expanded. Where the assignable causes have not been eliminated through using a P chart, then an $\bar{X}R$ chart is substituted so as to control the actual dimension by periodic inspection throughout the day. Over a period of time, the P charts are gradually eliminated, by substituting this patrol type inspection.

An example of the technique used is an illustration of installing quality control on the connecting rod. Daily rejections on this part were broken down into fifteen classifications. Fifteen charts were placed as close as possible to the operation, Fig. 4, causing the rejection and each morning, an inspector would plot the charts showing rejections for the previous day. Many of the rejections dropped to zero shortly after these charts were placed.

Quality Control on the Connecting Rod

A quality survey of the connecting rod showed 95 pct of all scrap and repairs to result from 15 classifications of defects, 8 of them scrap and 7 of them repairs. A system of statistical spot checking and control charts was developed to control the operations causing

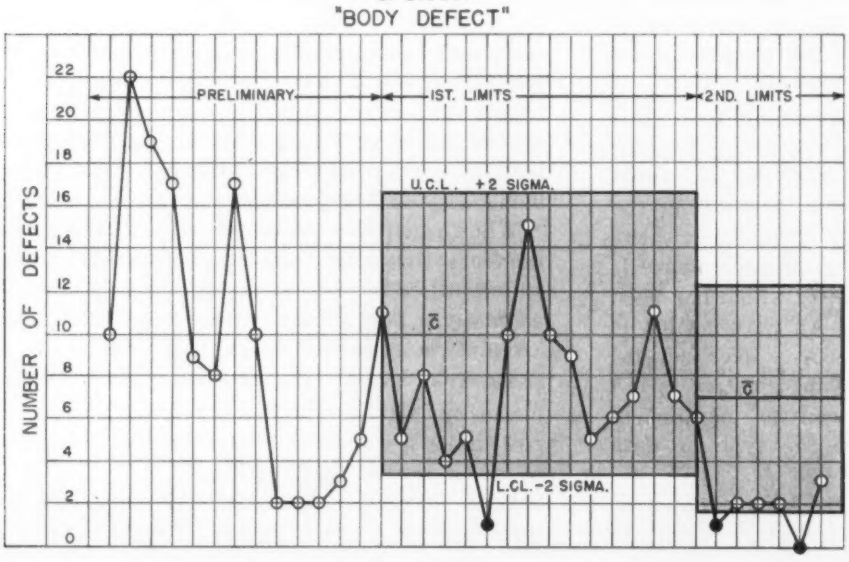


FIG. 2—C charts show the number of defects in a fixed sample size. Ten bodies are inspected and the number of defects observed are plotted on a chart placed close to the operation. This is repeated at each inspection interval. The average number of defects observed in a preliminary survey (at least 30 days) becomes $\bar{C}$ (called C bar) and statistical control limits are computed. At each 30-day period, a new $\bar{C}$ and new control limits are computed based upon the latest averages.

TABLE I

Quality Control

Type of Chart	No. of Charts	Operation	Equipment or Machine	Specified Tolerance
$\bar{X}R$	1	Thickness of crank and wrist pin ends	Hanchett Rotary Surface Grinder	±0.001 in. locating purpose
$\bar{X}R$	1	Squareness of mating faces with thrust faces at oil gear parting broach.	Hanchett Rotary Surface Grinder	±0.002 in. locating purpos
$\bar{X}R$	1	Side of half bosses to center line of rod	Kent Owens 2-Spindle Milling Machine	±0.001 in. locating purpose
$\bar{X}R$	1	Final step between crank end and wrist pin end	No. 2 Hanchett Rotary Surface Grinder	±0.001 in. locating purpose
$\bar{X}R$	1	Thickness of big end	No. 2 Hanchett Rotary Surface Grinder	±0.001 in. locating purpose
$\bar{X}R$	1	Roughing ID of crank end	Heald Boromatic	±0.001 n. locating purpose
$\bar{X}R$	4	Finish ID of crank end	4 Heald Gagematic Internal Grinders	±0.004 in. locating purpose
C	1	Nick and burrs		

Two daily P charts showing the percentage of rejections for scrap and repairs on entire production line are also used.

these defects. Ten $\bar{X}R$ charts and one C chart were required. The balance of the dimensions on the rods are still checked by end of line inspection, together with non-charted spot checks at the operation as shown in Table I.

Installation of quality control in other shops, was begun somewhat similarly although different techniques were necessary for patrol inspection. Dimensions were not available from which exact measurements could be made so $\bar{X}R$ charts were not used. The part is either good or bad, so that the P charts were either used alone or in conjunction with C-type charts.

In the paint shops a series of P charts were installed, where the operators can observe them, showing the daily rejections resulting from dirt, dings, mars and scratches, metal defects, sage, etc. Each four hours an inspector plotted the charts showing percentages of jobs rejected for these defects.

Assignable causes continued to occur in some cases so that additional controls were required. C charts were used for a patrol system of inspection to obtain the control required. At intervals throughout the day an inspector counted the number of defects observed on five consecutive bodies. This number is then posted on a C chart close to the area responsible for the defect.

Examples of work areas inspected are the paint booths, gas sanding, masking and sanding, and the rub deck. In the body shop, the C charts are placed on the welding of subassemblies. On the assembly lines, the C charts are placed along a segment of the line. P charts are also usually used to show the percentage of rejections of all pieces produced.

How to Make it Work

It is somewhat of a law among quality control people that quality cannot be inspected into a product. Once good material is contaminated with bad, it becomes impossible to remove all of it by practical inspection methods. The control of quality must originate in production itself. The method of statistical quality control is to control the operation so that defective work is not produced rather than attempting to sort bad from good once the damage is done.

The responsibility for quality, therefore, must rest with the production department and the primary responsibility of inspection is to give production information about the quality

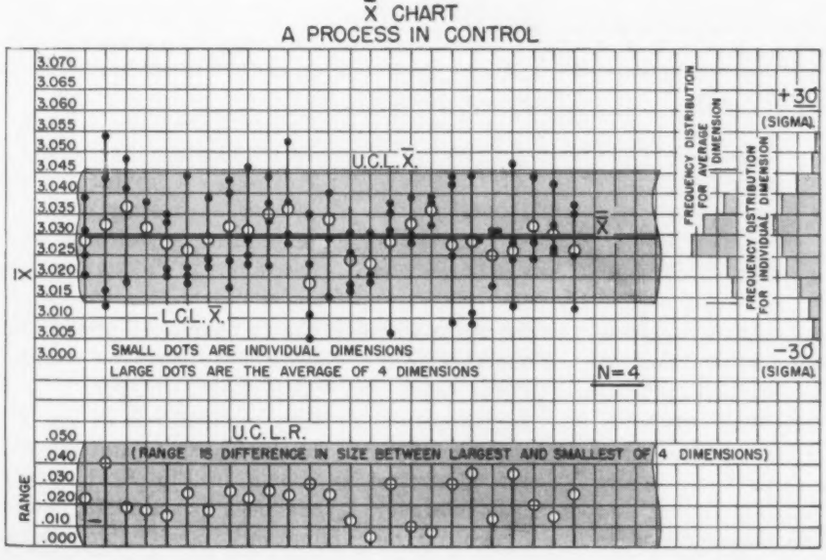


FIG. 3—The $\bar{X}R$ chart shows the average size and uniformity of a part. $\bar{X}$ on top records the size and R on the bottom, the range or uniformity. In the $\bar{X}$ section, each small dot is an individual measurement and the large dot is the average of the small dots. The large dot in the R section records the range or difference between the largest and smallest of the individual measurements made. Control limits are placed on the chart to mark the limits of the natural variability of the process at a probability of 99.7 pct.

which they can use for this control. Production supervision must have sufficient knowledge of statistical quality control so as to read the charts and know when to correct assignable causes.

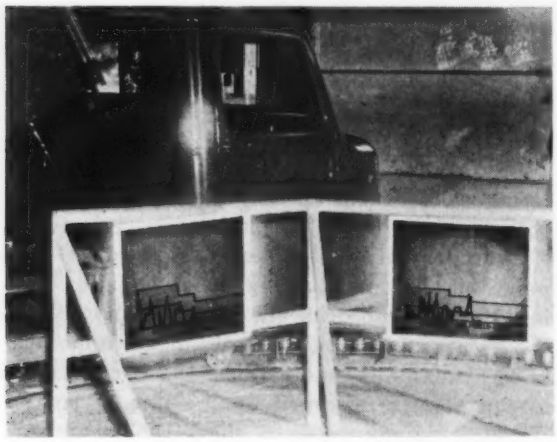


FIG. 4—Control charts in operation at the paint shop of the Willys body plant.

One of the big contributions of statistical quality control is in detecting and eliminating assignable causes. Assignable causes occur when defects exceed the previously established standard by such a wide margin that a change in the process is indicated. An immediate investigation should be made to learn the reason for the change, and necessary action taken to prevent it reoccurring. All three types of charts are used to detect assignable causes.

At the occurrence of each assignable cause on the P and C charts, an assignable cause slip is given to the production superintendent and he is requested to conduct an investigation to learn the change in the process. A monthly audit is issued by the statistical quality control department on all jobs where quality control is operated. This audit goes to management and shows (1) the quality level of the process; (2) the process rejection level which is a characteristic of the processes and at which the job should have operated, and (3) the nature of assignable causes which occurred.

Inspection continues its regular function of checking the quality of the work so as to protect the next fabricating department or the final customer. In addition, inspection gives production information regarding quality which is required by production to establish controls. Charts are used to give this information as they are the quickest and most accurate method available.

The regular inspection department takes over the statistical inspection operations as soon as the quality control department has completed the installation work on an operation. A continuous flow of jobs, therefore, are being processed.

Statistical quality control has been in operation at Willys-Overland since 1948. It is expected that several years will be required to complete the installation. Statistical inspection methods are being applied in the paint shop, body shop, machine shop, assembly lines, press shop, forge shop and receiving inspection. Fig. 4 shows the charts posted in the paint shop.

Results have been very successful. Several hundred charts are maintained. In 90 pct of the cases where P charts have been applied on operations, the quality has improved and in many cases, rejections have dropped to the vanishing point. Many applications of the $\bar{X}R$ chart have shown the process to be statistically out of control as shown in Fig. 5. In every case, however, it has been possible to obtain control by the elimination of assignable causes.

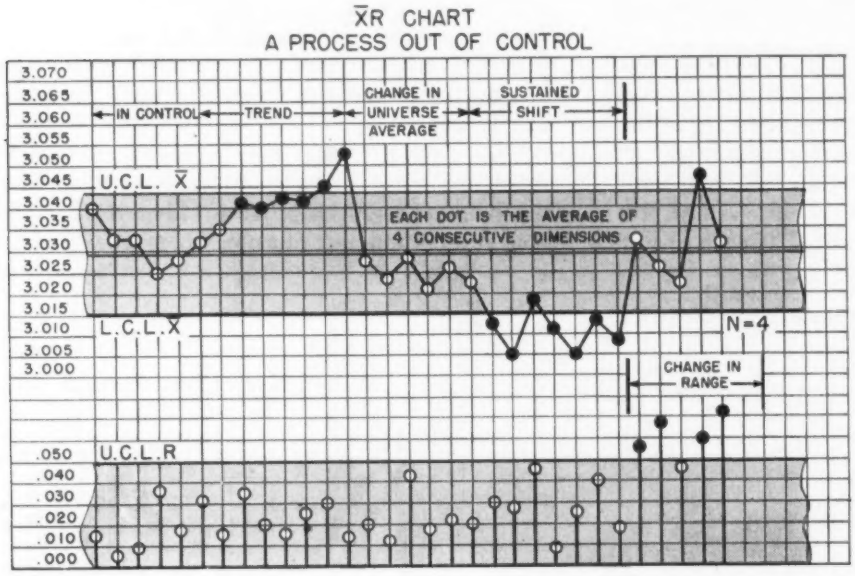


FIG. 5—This chart is similar to Fig. 1 in the way values are plotted. The chart goes out of control in the location marked trend because of different types of lack of control.

Inspection and Classification of Metals Made Easy

Use of the GE Metals Comparator has been broadened through development of a new test head. Large parts may be inspected nondestructively, and mixed lots of metals separated. The device is used for close control of composition, heat treatment, hardness, case depth and plating thickness.

By B. M. SMITH
Engineering and Consulting Laboratory, General Electric Co., Schenectady

SHEET steel, machine tool beds and other large metal parts may be classified and inspected with the General Electric Metals Comparator, through use of a new test head. Formerly, the Comparator had been confined to smaller metal parts that could be inserted in the conventional test coil, and to applications where only the surface was to be tested over a limited area.

Used in conjunction with the Comparator, the new device permits an operator to maintain close control of such characteristics as composition, heat treatment, hardness, case depth and plating thickness. Primarily a quality tester, the device provides an economical means of decreasing scrap losses resulting from mixed materials and incorrect processing of materials or parts. It may be used advantageously in a wide variety of industries.

The new test head, shown in Fig. 1, is approximately ¾ in. diam and 3 in. long. The contact face consists of a metal ring separated from a center core by an air gap, thereby forming a radial magnetic path across which the test piece is placed.

The various face diameters and designs shown in Fig. 1 are available to meet specific applications. For example, cap A is for general use and covers a ½ in. area, and is the standard cap furnished with each test head. Cap B is used for applications where the test is to be confined to a ⅜ in. diam area. Cap C is furnished for testing sheets and large areas where greater sensitivity is required, as in nonferrous materials. Cap D is for testing small diameter rods where the test is to be confined to the surface over a short length. Cap E is conically shaped for testing small areas in corners or on surfaces close to an upright section, as in lathe beds and similar applications.

In use, the test head is held like a pencil between the thumb and forefinger, in a vertical position. The center core of the head is backed by a helical spring so that when the test face

is placed on the surface of the test piece, the tip of the core and the rim of the face make contact with the surface when the operator applies a slight pressure.

The complete equipment, Fig. 2, consists of an electronic unit which includes a balancing network, an oscillator, an indicator, and a test unit which may be either the new test head or a coil. It operates on a single phase 60 cycle, 110 v commercial supply and provides test frequencies of 50, 250, 1000, 2500, 4000 and 10,000 cycles per sec.

Method of Operation

The equipment is basically an impedance comparator. The impedance of the test unit will vary with the electrical and magnetic properties of the test specimen; thus, the instrument will indicate changes in the chemical and physical properties, as these are correlated with the electrical and magnetic properties.

How these principles are employed will be understood by reference to the simplified schematic diagram, Fig. 3. When the power of the selected frequency is applied and the balancing resistors are adjusted to equal the impedance of the test unit with reference specimen in place, the instrument will indicate a balance (zero reading). When a test specimen of other properties is placed in position for test, the impedance of the test unit will change, which changes the instrument balance.

In normal operation, a reference specimen, selected by laboratory or operating tests, is placed in the test coil or against the test head to secure the initial balance as indicated by the zero reading on the indicating instrument. After removing the reference specimen the test parts are placed in position and held just long enough for the pointer to come to rest.

After tolerances have been established, a specimen can be accepted or rejected on the basis of the scale reading. Specimens with a higher permeability than standard give a deflection to right of zero (positive) and those of lower permeability read to the left of zero (negative). The range of frequencies provided permits testing of both magnetic and nonmagnetic metals. In nonmagnetic metals, discrimination is based mainly on resistivity; therefore, the higher frequencies are employed for testing and sorting this type of material. When only surface conditions are to be indicated, the high frequencies are used.

The Metals Comparator has been successfully applied throughout industry, wherever metals are produced or used. Applications have been numerous, and with the development of the new test head, wider utility is provided.

Extensive use of the metals comparator has been made in stock rooms of such industries as aircraft, automotive, chemical, electrical, refrigerator, machine tool and others. Stockpiles of bars, rods or sheets have been correctly separated from mixed lots of carbon steels, alloy and stainless steels, and the device is used for numerous nonferrous metals such as aluminum, copper, brass, bronze and other alloys.

To illustrate how the comparator can separate and group mixed materials, a few AISI

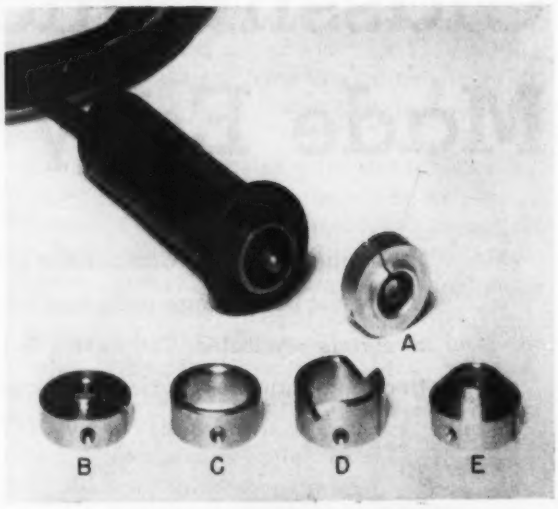


FIG. 1—Metals Comparator test head, showing the various cap sizes and face designs available for specific applications.

grades were tested as listed in Table I. Most materials will give a different reading for each grade when tested at 500 cycles. However, some grades may give similar readings unless a different frequency is used or a separate balance made with greater sensitivity.

In the table, Col. I, results of tests are recorded when using 500 cycles and a sensitivity of 2 with which most of the readings obtained are on scale. When greater differences in readings are required for positive separation, the sensitivity dial is turned one step to 3 which gives 4 to 5 times the sensitivity previously used. Test results using this sensitivity are given in Col. II. It will be noted that a majority of the readings in this column are now off scale, one group to the left (—25) and another to the right (+25).

To separate the samples giving the off scale readings, select one sample from each off scale group having the lowest numerical value in Col. I and rebalance as in Col. III where positive separation is indicated . Representative samples from each of these groups can then be chemically analyzed to determine the grades for each group.

In industries such as the tool, die and automotive where correct heat treatment is essential to die life or the wearing quality of the

product, it is necessary that a close check on the properties be kept in order to assure uniform quality. This requires a nondestructive test, and the Metals Comparator has proved reliable for this particular application.

An example of quenching and drawing is given in Table II. Listed are a representative group of 21 hardened and tempered pins of AISI tool steel E52100; the heat treatment might well represent conditions that could occur in regular production. It illustrates the advantages of a Metals Comparator over a hardness tester in that it does not mar the pin and, therefore, provides a 100 pct check. In addition, it indicates the internal structure of the pin, which is not indicated by a hardness tester.

Five conditions of heat treatment are given in which the average readings for four or five pins are given for each condition. Some pins are over hardened and correctly tempered, some correctly hardened and over or under tempered. Those which are correctly hardened and tempered were used as reference standards when balancing the instrument for zero reading. The readings to the left of zero indicate the pin to be less magnetic and those to the right, more magnetic.

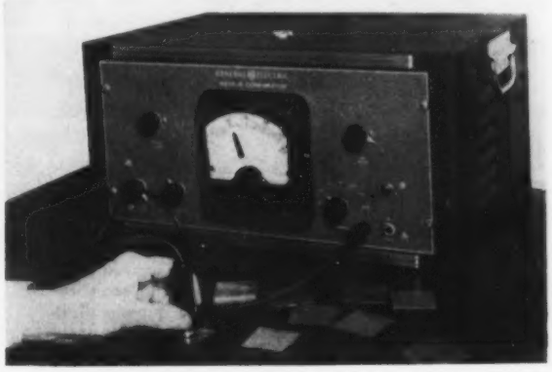


FIG. 2—The new test head in use with the electronic unit. Correct application of the head to the part being inspected is shown.

It will be noted that readings for the comparator and Rockwell tester correlate for all pins except those in the last group of five. It is here that the comparator indicates a soft magnetic condition of internal structure, whereas the Rockwell tester indicates a hard physical condition.

As tempering proceeds the martensite is softened, tending to lower the hardness and increase the magnetic properties. However, within certain tempering ranges the austenite is converted into martensite which tends to raise the hardness as well as increase the magnetic response. This condition is reached in the last group of five samples listed in the table. The magnetic test indicates the amount of retained austenite necessary for good quality whereas the hardness test does not.

TABLE I
SEPARATION OF MIXED STEELS

Material AISI	Col. I Sens. 2	Col. II Sens. 3	Col. III Sens. 3
4130	Bal. 0	Bal. 0	.....
1020	+ 2	+ 8	.....
3135	+ 8	Over + 25	Bal. 0
4615	+10	Over + 25	+ 5
4340	+11	Over + 25	+12
B1113	− 3	−14	.....
8630	− 7	Over − 25	Bal. 0
8740	− 8	Over − 25	− 5
1315	−23	Over − 25	−25

All tests at 500 cycles.
+ Indicates reading to right of zero.
− Indicates reading to left of zero.

Hardness and Case

The Metals Comparator has given exceptional service for determining hardness and depth of case. In the automotive industry it is applicable to wrist pins, valve lifter plugs, gears and cylinder wall liners. In the machine tool industry it is used with a test head on lathe beds and other large parts that cannot be tested in a coil.

Another application for hardness was made in a tool industry on band saw blades, where the relative hardness and depth in the teeth was essential to quality. Other types of cutting tools have also been successfully graded for hardness and quality.

The Comparator has been successfully applied to many special problems not usually associated with the comparison of metals. Among such special applications has been the sorting of over and under sintered alloys, case differences in brass, purity of copper wire,

TABLE II
SEPARATION OF HEAT TREATED PINS[1]

No. of Pins	Treatment		Comparator Readings, Average[4]	Hardness, Rc, Average[5]
	Hardened[2]	Tempered[3]		
4	1562°F correctly hardened	not tempered	−29	79
4	1652°F overheated	1004°F correctly tempered	− 7	62
4	1562°F correctly hardened	1004°F correctly tempered	0	58
4	1562°F correctly hardened	1112°F over tempered	+ 6	51
5	1562°F correctly hardened	797°F under tempered	+15	67

[1] Alloy steel, AISI E52100.
[2] Hardened for 15 min at temperature; oil quenched.
[3] Drawn for 1 hr at temperature.
[4] Tests made at 50 cycles, sensitivity 2.
[5] Hardness taken at center of pin.

magnetic inclusions, hard spots, plating thickness, welding quality, and detection of shorted turns in electrical coils.

One other application has been in testing heat treated welds of stainless steel for changes in microstructure. To detect ferrite in such structures is difficult with the microscope or hardness tester but by means of the test head, used in conjunction with the Metals Comparator, this magnetic condition can be quickly detected.

The applications described are some of the principle uses of the Metals Comparator determined to date. With the introduction of the new test head, many of the applications heretofore found unpracticable with a test coil are now successful. However, only through trial and use of this new test head can the Metals Comparator reach its full scope of successful application.

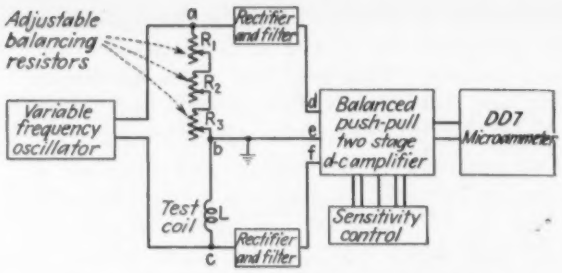


FIG. 3—Schematic wiring diagram illustrating the principal components of the Metals Comparator, which is basically an impedence comparator.

Radium

Used in Water Pipe Examination

USING radium for examining welds and castings is a widely used technique, where porosity, slag inclusions, and cracks are detected, but radiography was recently used in connection with a common maintenance inspection by Sam Tour & Co., New York. Difficulty was experienced in obtaining adequate water through galvanized iron pipes in service for about four years, and a booster pump installation gave no marked improvement.

By radiographing various places in the system, it was found that a comparatively short horizontal length of 1½ in. pipe running from the hot water storage tank to the vertical riser was in bad condition. The radiograph is shown in Fig. 1.

The uneven mottled pattern shows a heavy deposit of rust and scale of such magnitude as to almost stop the water flow at 70 psi pressure. The pipe, which was made by butt welding, shows deep pits or discontinuities at the weld. Also, and of greatest importance, severe pot hole corrosion had progressed so far as to leave only paper thin areas in the pipe wall.

The particular section which was radiographed in place was removed and X-rayed, then split lengthwise. The split pipe is shown in Fig. 2, and shows graphically what the radiograph of the pipe showed the expert reader. X-ray examination of the section before splitting did not show the pot hole corrosion as well as did the radium radiograph.

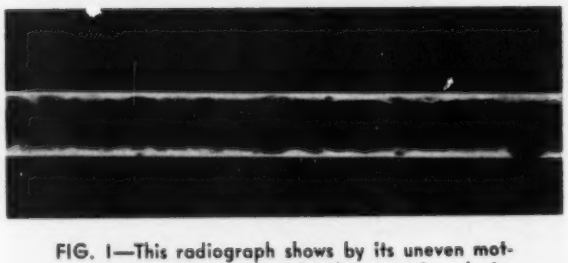


FIG. 1—This radiograph shows by its uneven mottle pattern a heavy deposit of rust and scale inside the pipe and spots where the pipe wall is about corroded through.

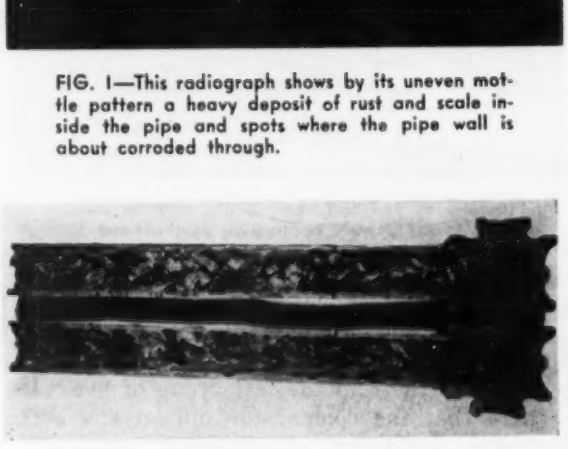
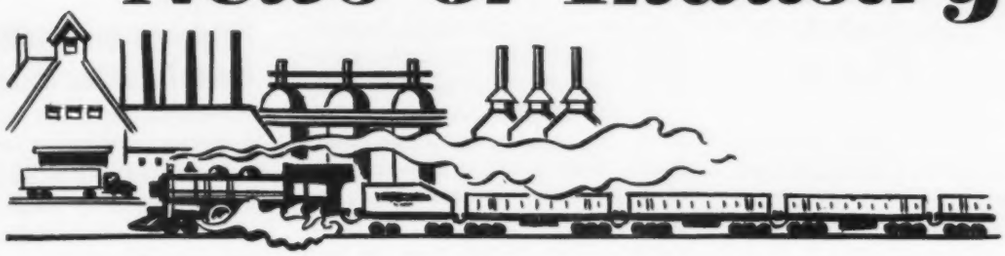


FIG. 2—The pipe shown as a radiograph in Fig. 1 was split, and this shows its condition. An indication of the advancement of corrosion was clearly discernible from the radiograph taken of the pipe in service.

Although either method might be used, radium was preferred for economic reasons. Radium is fully portable in the capsule, weighing only a fraction of an ounce, and no electrical connections are required.

News of Industry



Rail Rates Approved

Washington — The collective groan of highway haulers is thunderous. The track was cleared for reduced freight rates on selected manufactured items on iron and steel on May 1 when the Interstate Commerce Commission voted recently to uphold proposed new tariffs filed by Eastern railroads. Revisions apply to shipments of 80,000 lb or more (THE IRON AGE, Apr. 20, 1950, p. 103) and average more than a 25 pct reduction.

Gas Range Shipments Rise

New York — About 258,000 domestic gas ranges were shipped last March for an increase of 70 pct over the 151,000 units in March '49 shipments, reports Edward R. Martin, director of Marketing and Statistics for GAMA. The 1950 shipments in March are 91 pct higher than the month's pre-war average. They topped March 1948 shipments of 252,100 units which set a record.

Homebuilding Record Set

Washington—An all-time homebuilding record was set in March when 110,000 nonfarm starts were reported, bringing the total for first quarter 1950 to 270,000 units.

This is 90,000 more than for the first quarters of either 1948 or 1949. If the increased activity holds up through the traditional heavy building months of summer and fall, a new annual high may be recorded during 1950.

COLUMBIUM—New Uses and Limited Supply

Jet, gas turbine alloy uses vie with stainless steels for limited supply of columbium . . . Nigerian ore shipments drop . . . Tantalum has substitute use—*By JOHN ANTHONY*

New York—The high temperature alloys so important to jet engines and gas turbines are now in competition with the heat and corrosion resistant stainless steels for the world's limited supply of columbium, an alloying agent that has acquired strategic importance in the last decade.

Columbium is now being allocated, in the form of ferrocolumbium, to producers of stainless steels and alloys. Measures are being taken to extend available supplies, and to supplement columbium use with other alloying agents. Columbite ore is being bought for the U. S. strategic stockpile.

Nigeria Largest Producer

Nigeria is by far the largest producer of columbite ore, as a byproduct of tin mining. Imports to the United States, the largest consuming nation, have been tapering off ever since the peak wartime years. Imports of concentrates ranged from 2 to 4 million lb a year during the war. They dropped sharply in 1948 and in the past year.

Expanded British production of the high temperature alloys has been taking more Nigerian columbite. Output in 1947 was 1286 long tons, as reported by the U. S. Bureau of Mines, of which 71 pct went to the U. S., 21 pct to U. K., and 8 pct to Norway. Nigerian output was down slightly in 1948 to 1238 tons, two-thirds going to the U. S. and one-third to U. K.

Congo Produces More

Belgian Congo production of columbite has grown rapidly in the last few years. But Congo ores are lower grade. Nigerian ores average 50 to 60 pct Cb_2O_5, compared with about 35 pct in Congo ores. U. S. imports from the Congo were 113,813 lb in 1948. Imports in 1949 were appreciably higher. Columbite output of the Congo was insignificant in previous years.

Columbium is an important addition to the super temperature alloys. It maintains strength at

Turn to Page 102

Allegheny Ludlum First Quarter Earnings Mark Record

Pittsburgh—First quarter sales volume of Allegheny Ludlum Steel Corp., $37,551,378, was the highest in the company's history, and order books coupled with strong demand indicate a continuation of high level operations. First quarter sales a year ago were $33,233,376.

Net earnings for the quarter were $2,270,681, or $1.67 per common share after provision for preferred stock dividends, as compared with $1,542,195 in the comparable period of last year.

Columbium Supply Limited

Continued from page 101

high temperatures and provides good resistance to creep. Typical high temperature alloys have tensile strengths as high as 50,000 psi at temperatures up to 1500°F. Columbium is used in these alloys in quantities ranging from 1 to 4 pct, and in some alloys up to 5 pct.

Columbium is added to stainless steels of the austenitic (chrome-nickel) type to prevent carbide precipitation and subsequent intergranular corrosion when exposed to temperatures of 800° to 1500°F during hot forming or welding operations, or when exposed to continuous operation within this temperature range. Columbium used in a minimum ratio of 10 x carbon content takes care of the carbon.

In the ore, columbium is always associated with tantalum. Columbite ores with a high tantalum content have not, heretofore, been useful. But in order to extend supplies of columbium these ores are now being processed to recover a ferro-tantalum-columbium alloy containing 40 pct Cb and 20 pct Ta.

Tantalum As Substitute

Tantalum can be substituted for columbium in the high temperature alloys on a point for point basis, providing equal strength and creep resistance. Specification bodies, such as SAE's Aircraft Material Specifications, are now working out optional specifications using tantalum in high temperature alloys up to 50 pct of the Cb plus Ta content.

It is estimated that the ferro-columbium-tantalum alloy containing 40 pct Fe, 40 pct Cb and 20 pct Ta will be effective in stabilizing the heat resisting alloys when added in quantities that take into consideration the fact that twice as much tantalum is required as columbium.

Stainless steel can also be stabilized with titanium with an effective minimum ratio of 5 x carbon. The cost of ferrotitanium is lower than ferrocolumbium, and smaller quantities are required. But titanium stabilization is not generally used for high temperature conditions. Such steels can be annealed after exposure to temperatures in the sensitivity range during fabrication. They do not meet the boiling concentrated nitric acid test.

Low Carbon Steels

Stabilizing additions of columbium are not needed to protect austenitic stainless steels against intergranular corrosion when they can be heat treated after exposure to the dangerous temperature range during fabrication. When treated at 1950° to 2000°F and quenched rapidly, the precipitated chromium carbides go back into solid solution.

Columbium conservation also lies in the wider use of the new extra low carbon stainless steels recently offered by some producers. The extra low carbon grades containing 0.03 max carbon may be substituted for the stabilized grades of stainless where equipment is used in the as-welded or welded and stress relieved condition. Columbium stabilized grades are best suited to those applications where equipment operates continuously from 800° to 1500°F.

Resume Your Reading on Page 101

"Company strategy, Brlofski. These two of the boss' relatives aren't covered by the minimum wage law for some reason."

Pittsburgh Heavy Industry Fights Local Tax Assessments

Carnegie-Illinois hit heaviest by increases; hearing set for May 29.

Pittsburgh—The battle between heavy industry and Allegheny County over the county's new tax assessment policy covering mill machinery is working up a full head of steam.

Steel producers and other industries in the Pittsburgh area are appealing to the County Tax Board on tax reassessments which have doubled and tripled in some cases over 1947 assessments. The companies maintain that the heavy tax increases tend to discourage modernization and expansion in this district and put them as a disadvantage with competitors in other parts of the country.

Carnegie-Illinois Steel Corp., the largest taxpayer in the county, was hit hardest by the reassessments, having been given a $46 million increase. The company's appeal from this will be presented at a May 29 hearing.

Outside Investigation Made

The assessment increases were made after the county hired an outstanding engineering firm, Cole-Layer-Trumble Co., Dayton, to place a value on the machinery. Heretofore, the county had relied on the appraisals of its own assessors.

Carnegie-Illinois has pointed out that existing taxes already amount to 48¢ per ingot ton as compared to only 19¢ per ton for steel producers at Sparrows Pt. and Youngstown. The new assessment increase would boost Carnegie-Illinois' tax to 65¢ per ton.

Award Alhart Distributorship

Chicago—Exclusive distributor rights for the Alhart pattern developer in the Chicago area was given the U. S. Steel Supply Co., here, by the Stewart Sales Co., Minneapolis. It is claimed that the device will draw any pattern in about a minute regardless of angle or fitting and may be operated by unskilled persons.

Carnegie-Illinois Sponsors Safety-First Program in Schools

Pittsburgh—In the belief that it is never too early to teach industrial safety, Carnegie-Illinois Steel Corp. has developed a program of safety education for schools in the Pittsburgh and Gary, Ind., districts.

The plan was outlined here recently to 350 educators and state officials by Clifford F. Hood, president of Carnegie-Illinois, and S. M. Jenks, vice-president in charge of operations.

Primary aim of the program, identified as "Safety in the Workshop," is to bring home to future industrial workers the importance not only of being safety-minded but also to learn something about precautions that must be taken in an industrial plant to insure workers' safety.

Radiator Corp. Buys Site For New Cleveland Warehouse

Cleveland — American Radiator & Standard Sanitary Corp. has purchased 2½ acres for future construction of a $500,000 warehouse. The land was purchased from the Pennsylvania Railroad at a cost of more than $157,000.

"We are planning now for future growth of Cleveland and our growth to keep up with it," George Caleb, Cleveland manager said. This plumbing and heating equipment maker has occupied the same 5-story warehouse for the past 36 years.

Quality Control Features To Be Discussed at Convention

Milwaukee — Three aspects of quality control — "Greater Quantity, Better Quality, Lower Cost" —will be the theme of the Fourth National Convention and Fifth Midwest Conference of the American Society for Quality Control.

Training sessions, clinics, and demonstrations will be held in this city on June 1-2. Lewis D. Crusoe, vice-president, Ford Motor Co., and Ford Div. general manager, will discuss "What Management Expects of Quality Control" at the June 2 luncheon. The planning committee is under the direction of R. S. Saddoris, of the A. O. Smith Corp., Milwaukee. Dr. Edwin G. Olds, Carnegie Institute of Technology, is in charge of training sessions.

Information and registrations may be obtained from the ASQC, P. O. Box 1204, Milwaukee 1.

Probers Sniff into Fabricating Activity

Celler charges large steel takes all new sources of raw materials . . . U. S. Steel men to offer rebuttal . . . No definite legislation seen yet—*By GEORGE BAKER*

Washington—The current congressional probe of the steel industry had broadened out this week to include an investigation of fabricating activities by major steel producers.

Last week, Rep. Celler, D., N. Y., chairman of a House committee studying "monopoly trends," charged that large steel firms were "freezing out" smaller steel producers in competition for new sources of raw materials.

Officials of U. S. Steel, scheduled to testify this week before the investigating group, were prepared to answer this and similar complaints that "encroachment" by steel producers into the fabricating business was "steadily" creating a lack of competition among independent steel construction contractors.

"Fogarty, somehow I suspect the union will have a few words to say about the two new men."

Recommendations Expected

While no definite legislation is yet before Congress as a result of Mr. Celler's investigation thus far, committee members have indicated that he is drafting recommendations designed to limit the activities of companies operating large, integrated facilities.

Mr. Celler disclosed during a public hearing last week his belief that steel producers should be limited to the basic production and prohibited from engaging in any of the fabricating lines. He voiced this opinion after listening to the contention of J. Philip Murphey, Judson Steel Corp., Emeryville, Calif., that independent fabricators on the West Coast were being "pushed out of business" by such firms as U. S. Steel and Bethlehem.

Wants Broader Investigation

This same view was expressed before the committee by Gustave H. Koven, L. O. Koven & Bros., Jersey City, N. J., who said he doubted whether any steel company should be permitted to fabricate a fairly complicated product or structure, and, in effect, sell it to the ultimate consuming public.

"Too much money is going into construction or acquisition of manufacturing plants for finished articles, and not enough into the

modernizing and expanding of facilities for manufacture of finished steel," he declared.

Tom J. Smith, Jr., former president, Pressed Metal Institute, Cleveland, told the committee "the time had come" to examine all basic metal industries and "ascertain the extent to which governmental intervention may preserve a free competitive economy."

White, Fairless Denounce Conduct of Monopoly Hearings

Fairless raps mysterious witnesses . . . White's report sidetracked.

New York—A prejudiced view and sleight-of-hand tactics of springing sudden unforeseen attack against the steel industry without giving it a Chinaman's chance of introducing retaliatory evidence in the Washington monopoly hearings conducted by Rep. Celler, D., N. Y., are charges of two steel presidents.

First to strike back was Benjamin F. Fairless, president of U.S. Steel, who pledged that the Committee would be given the true facts when the industry "was afforded an opportunity to do so."

Mysterious Strangers

Mr. Fairless said that Mr. Celler had mysteriously alluded to "countless people coming to his Subcommittee" with sad tales of being forced out of business but who were in fear of testifying because of possible reprisals.

Mr. Fairless said that Celler's statement was not true if it referred to U. S. Steel and that if any of the mysterious complainants were the firm's customers, U. S. steel should be permitted to hear their testimony before the Committee so that remedial steps could be taken if needed.

Impolite Brush-off

C. M. White, president of Republic Steel Corp., said that it was "discouraging to appear before a committee and find that matters totally unforeseen are brought up to divert attention from the important matters on hand."

Mr. White referred to his preparation of a detailed report on the iron ore situation, the major problem, which was relegated to a minor role when an "iron ore broker from Georgia rambled on confusedly on the trival matter of a small iron ore commitment for our Southern plant."

Mr. White said that on the spur of the moment he could have had no information on the matter and had no opportunity to summon witnesses on his behalf. When, finally, he was allowed to present his important paper, his listeners one by one filed out to attend House duties. He was left with Mr. Celler and his counsel who alone heard the statement.

Attacks on Big Business Unwarranted, Charges Fairless

Baltimore—Ben Fairless, president of the U. S. Steel Corp., declared that the sniping campaign of "misguided planners and politically ambitious office holders" directed against his firm was an unwarranted attack against big business as an entity. Mr. Fairless spoke before the Baltimore Assn. of Commerce.

"While U. S. Steel has been singled out as a target," he said, "this is only temporary." The investigators will also have managed to put every successful growing business on trial, he added.

Chile Steel Mill Becomes Integrated

Blowing in of blast furnace coincides with completion of 57 coke ovens . . . Designed, built by Koppers Co. . . . Government power to be used—*By JOHN DELANEY*

Pittsburgh—South America's industrial growth moves another step forward next week when Chile's first steel mill, already turning out flat-rolled and merchant products from semi-finished steel from the United States, becomes completely integrated with the blowing in of a blast furnace.

260,000 Net Tons is Capacity

Starting up of the blast furnace, designed to produce 700 tons of iron per day, was timed to coincide with completion of a new battery of 57 coke ovens, from which the first coke was pushed only 2 weeks ago. Designed and built by the Koppers Co., the ovens have a capacity of 1100 tons of coke per day.

Work on the Chilean mill, built at a cost of more than $70 million, was begun late in 1947. In addition to the coke ovens, blast furnace and finishing facilities, the mill includes one open hearth furnace and a bessemer converter, and auxiliary facilities for handling tar, light oils and gas. An electric furnace probably will be added later.

Located on San Vicente Bay, a deep water harbor near Concepcion, the mill has a rated annual ingot capacity of approximately 260,000 net tons. Finishing mills include a blooming mill, a breakdown mill, a sheet bar finishing mill, sheet and tin mills and a combination merchant and rod mill. Finished products include sheets, tinplate, galvanized stocks, reinforcing bars and merchant mill products.

With supervisory assistance from the Koppers Co., the plant was erected for the Pacific Steel Co., of Chile. It is only 25 miles from the Schwager coal mines and 450 miles south of the rich El Tofo iron ore field operated and mined by Bethlehem Steel Corp. It was built with the expectation of later expansion.

The mill is assured of ample power from the government's hydroelectric system, which is being constantly expanded. Power generating equipment is also available at the plant.

Most of the mill's output will find its way into the domestic market. Some will be exported.

Westinghouse Sales Manager Predicts Business Volume Rise

Pittsburgh—Industry is chary of advancing optimistic forecasts of earnings in future months. The trend is usually obvious but the possibility always exists of something going amiss.

T. J. Newcomb, sales manager of Westinghouse Electric Appliance Div., has taken a perch on the proverbial limb but with little risk. He said that total dollar volume of Westinghouse business in the next 3 months will exceed the volume of the first three in which business topped the $40 million mark.

Produce at Highest Rate

Mr. Newcomb stated that production is at the highest rate in history and would be even greater if the firm could get more porcelain enameling steel for refrigerators, ranges, and other products. Enlivened business is partly due to reduction of inventory in 1949, new models, and sound installment buying, he said.

At the recent annual stockholders' meeting in Philadelphia recently, Gwilym A. Price, president of the Westinghouse Electric Corp., reported that first quarter earnings were higher than last year's and that 1950 business "will probably not be too far behind 1949." Net income for the quarter was $11,890,377 as compared with $10,866,921 in '49. He disclosed that $149 million had been spent on the firm's postwar expansion and modernization.

McCall Re-elected President

Lone Star, Tex.—J. D. McCall was re-elected president and chairman of the board of directors of the Texas and Northern Railway Co. at the stockholders' annual meeting recently.

Others elected were: Milford J. Rose, vice-president in charge of traffic; Guy D. McBroom, treasurer and auditor; and George R. Davis, secretary. The railroad serves the Lone Star Steel Co. and plans to convert to diesels.

INDUSTRIAL SHORTS

ROLLING AGAIN—Operations at LUKENS STEEL CO.'S 206-in. plate mill at Coatesville, Pa., were resumed last week after an 11-week suspension while the mill was being electrified. This is the largest part of Lukens' improvement program costing more than $2 million.

RESIGNS—Reid Robinson has resigned as vice-president of the INTERNATIONAL UNION OF MINE, MILL & SMELTER WORKERS. His reasons for leaving were "purely personal." He had been vice-president of the union since 1948 and president from 1936 to 1947.

METALLURGICAL AWARD—Max W. Lightner, manager, Research & Development Div. of Carnegie-Illinois Steel Corp.'s Research & Technology Dept., has been elected by the Penn State Chapter of the AMERICAN SOCIETY FOR METALS to receive the annual David-Ford-McFarland Award for Achievement in Metallurgy.

IN BUSINESS — Dr. Marcus Thau has organized UNIVERSAL COATINGS INC. at 10 Ave. C, Newark, N. J. The new company will enter activities not only to create engineered finishes but will continue to answer the requirements for enhancing adhesion universally.

BUILDING—Work is scheduled to start immediately on a new $2 million CARRIER CORP. plant in Syracuse N. Y. The company, manufacturing air conditioning units, will also spend another $1 million to equip their factory on the outskirts of the city.

SALES REP — Winfield H. Smith Corp., Springville, N. Y., manufacturer of speed reducers, has appointed the newly formed WINSMITH - BUFFALO company in Buffalo, as its New York State and Western Pennsylvania representative.

CHANGES TITLE — Effective July 1st, the name of the NINETEEN HUNDRED CORP., St. Joseph, Mich., manufacturers of home laundry equipment, will be changed to the Whirlpool Corp.

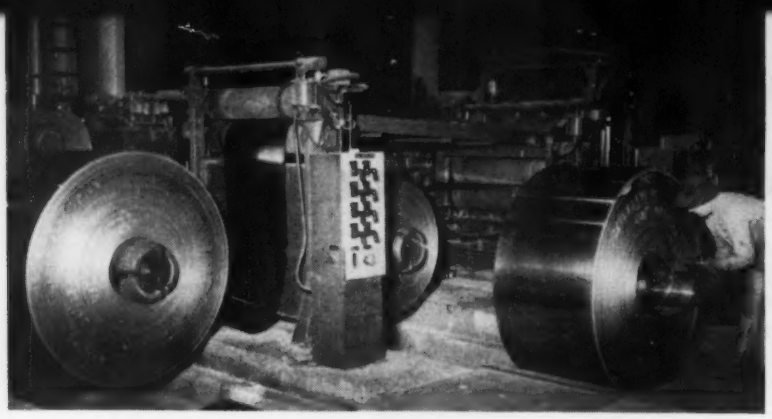
MPA STANDARD — A new Standard designated as M.P.A. Standard 8-50T, Tentative Method for Acceptance Tests on Structural Parts Made From Metal Powders, has recently been released by the METAL POWDER ASSN. This is the association's first standard which covers methods specifically for use by fabricators and users of structural parts made from metal powders.

MOVES—The executive offices of ALBOT STEEL CO., INC., have moved from 50 E. 42nd St., New York to the firm's new steel warehouse and office building at 700 Schuyler Ave., Lyndhurst, N. J.

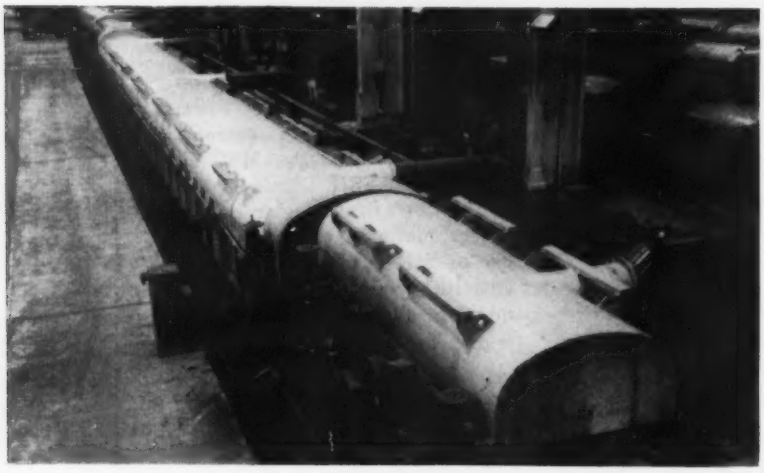
GEAR AGENT — Foote Bros. Gear & Machine Corp., Chicago, has appointed ASSOCIATED AIR SERVICE, Dallas, to represent the Precision Gear Div. in the sales and service of aircraft quality gears, actuators and power units in the states of Kansas, Oklahoma, Texas, Missouri and Arkansas.

NEW LOCATION — A warehouse at 926 North 22nd St., Birmingham, has been leased by SIGNODE STEEL STRAPPING CO., manufacturer of strappings for shipping containers. Manufacturing operations will begin as soon as equipment is available.

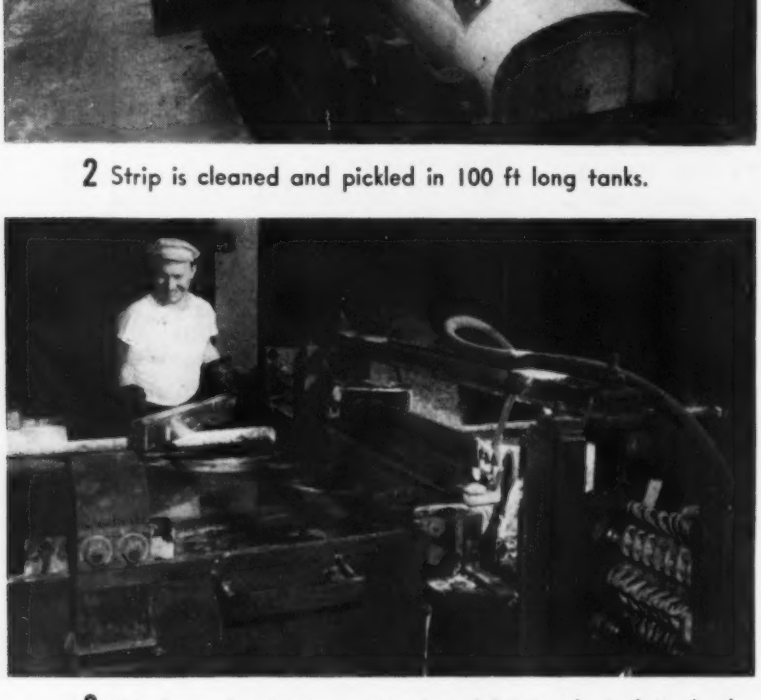
BUYS DEFENSE PLANT—A $1 million defense plant built by the U. S. Government early in World War II has been sold for $65,000 to the NORRY ELECTRIC CO., Rochester. The 59,000 sq ft plant was operated by Symington Gould Corp. which has moved to Depew, N. Y.



1 Steel strip enters line at speed of 2000 to 2500 fpm.

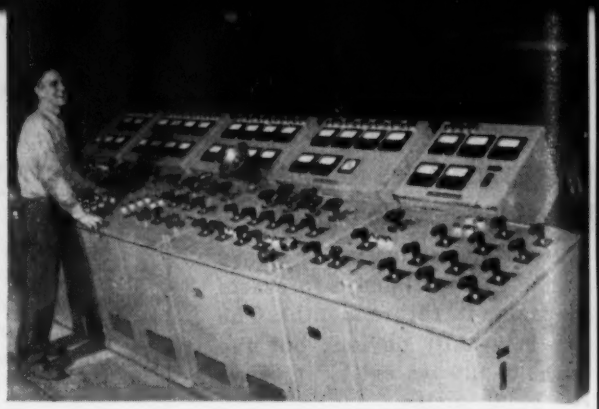


2 Strip is cleaned and pickled in 100 ft long tanks.



3 Workman loads tin casting (anode) into electrolytic bath.

4 Triple decks coat both sides and remove electrolyte.



5 Loudspeaker helps operator direct control from this p

Fastest Electrolytic Tinplate L

Pittsburgh—The shift from hot dip to electrolytic tinplate production was never more evident than in March. Two producers announced plans to build new electrolytic lines, while a third took the wraps off the biggest and fastest line in the industry.

Some tin plate men believe that it is only a matter of time before 90 pct of the tin plate produced in this country will be electrolytic. At the rate new capacity is being added, that day is not too far off, they say.

Accounts for Half

The amazing part of the electrolytic story is that less than 12 years ago the process was in the pilot plant stage. Only nine years ago electrolytic production was so insignificant that the American Iron & Steel Institute did not list the tonnage. Last year, however, electrolytic production had increased to the point where it accounted for better than half of all coated tin mill tonnage (THE IRON AGE, Mar. 23, 1950, p. 80).

Wheeling Steel Corp. and Carnegie-Illinois Steel Corp. have announced plans to build new lines to produce within the next 12 months. A Midwest producer is understood to have similar plans. Weirton Steel Co. started up its new No. 4 line last month.

Move to Steubenville

Weirton Steel is proud of its new line. It says it's the largest and fastest in the country; that its capacity, added to that of two older lines, makes the Weirton plant the world's largest tin mill.

The rated capacity of the new line is 5 million base boxes annually, raising the company's annual production to 15 million base boxes or roughly 680,000 tons. All hot dip production facilities except three stacks for re-tinning "menders" have been moved to the Steubenville, Ohio, plant. The fourth electrolytic line at Weirton coats steel strip with zinc.

Control panel in substation under line is automatic.

rapped by Weirton Steel Corp.

Weirton is expected to step up the speed of the older lines to approach the 2000 to 2500 fpm capacity of the new installation, which is better than 1000 fpm faster than its predecessors.

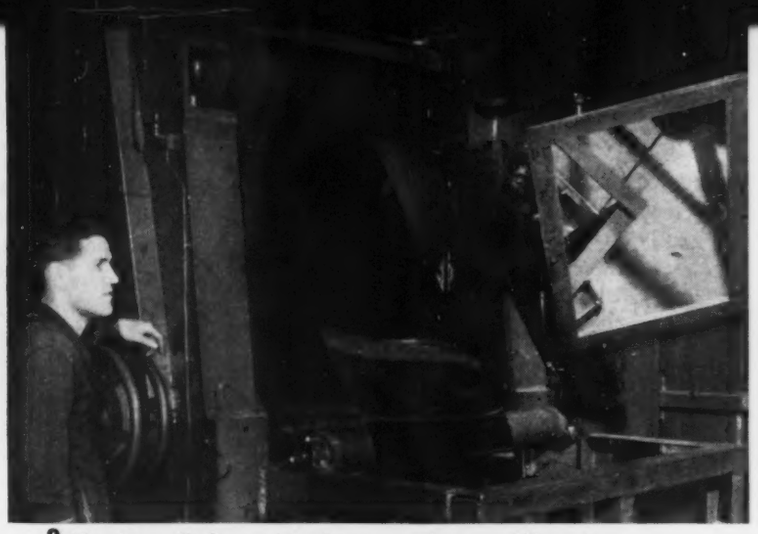
Wean Engineering Co., Warren, Ohio, and the Westinghouse Electric Corp. manufactured the equipment for the new line, which was designed by Weirton's own engineering department.

While arrangement of the new line is similar to that of the older lines, No. 4 line's reflow unit and chemical treatment tank are placed just after the plating unit and ahead of the looping pit, the reverse of the old setup. The pickling tank is 100 ft long, 30 ft longer than the tanks on the old lines because of the higher speed of the new unit.

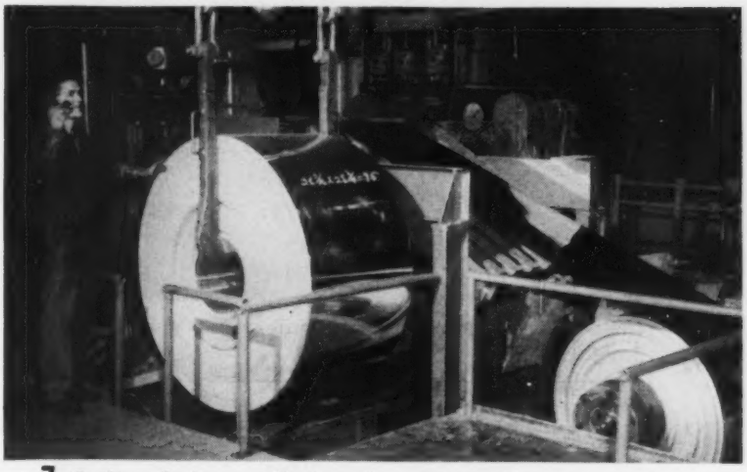
Features of New Line

Other features of the new line and its operation include: (1) in the reflow unit, the fast-moving strip is heated to the melting point of tin by eight radio tubes concentrating 600 KW power within a narrow space of 18 in.; (2) the entire reflow operation uses 1800 KW power; (3) generators providing electric current will produce enough power to meet the needs of a city the size of Wheeling, W. Va.; (4) production is equal to 25 modern automatic-fed tin pots; (5) a new quality control building where a constant check is made on hardness, ductility, and thickness of coating; (6) to accommodate increased production three new cutting lines were installed, bringing the total number of cutting lines for electrolytic tin plate to seven.

Weirton has been a pioneer in electrolytic tinning. It built an experimental 10-in. wide pilot line in 1938, and the first strip came off this line on Thanksgiving Day of that year. On the basis of this experience, the company authorized construction of a 38-in. line in September, 1942. The following year, through the cooperation of Weirton and the Du Pont Electroplating division, successful development of the Halogen Tin Bath was made possible.



6 Tension rolls keep strip from sagging, avoiding stops.



7 Coiling devices at line's end permit continuous operation.

8 Ductility and hardness are tested in quality control lab.

9 Tinplate is sheared, mechanically and visually inspected.

GE Electrical Wonders Train Starts Journey at Grand Central

Latest equipment in full range of field shown in 2000 displays.

New York—On Grand Central Station's track 30 this week hundreds of invited passengers are boarding a General Electric exhibit train called the "More Power to America Special" for a 2-hour trip through a world of science in electrical equipment.

The 10-car train is in New York for 2-weeks on the first leg of a 2-year nation-wide odyssey that will carry it through 150 industrial cities displaying a full gamut of products for the production, distribution, and industrial utilization of electric power.

Purposes Defined

At a press luncheon last Monday at the Hotel Biltmore, speakers of the General Electric hierarchy defined the aims of the Special as furthering the "modern concept of industrial selling," giving the consumer a dramatic insight into new ideas and new inventions, stimulating expansion and modernization to accommodate future needs, and strengthening the national economy by protecting it against "drift, dullness, and lassitude."

Sponsored by the Westinghouse Apparatus Div., two of the ten cars are for the passengers' convenience and the remaining eight are neatly crowded with exhibits of more than 2000 of the latest electrical products, systems, and techniques.

Trade Harmony Continues

Washington—The United States and Canada in 1949 continued to be each other's best customer, according to statistics released by the Canadian Department of Trade and Commerce.

Canada purchased goods valued at $1,951,860,965 from America and imported American goods worth $1,503,458,711. The Dept. noted that Canadian per capita purchases in the United States were approximately $142 while American per capita purchases in Canada totalled $10. On that basis Canada spent 14 times as much.

United States exports to Canada increased $146,097,280 over 1948, while Canada's exports rose only $2,471,990.

Celebrate 85th Anniversary

Rochester, N. Y.—The Gleason Works has been building bevel gear machinery here for 85 years. And they hope to keep building it for more than 85 years more. Recently they celebrated their 85th birthday with an open house, plant tour, luncheon and all the festive trimmings befitting a firm of such long standing repute as builders of machinery for the metalworking industry.

E. B. Gleason

The employees won their share of acclaim, too. Special awards were presented to 40 members who have served the firm faithfully for over 35 years.

In addition to E. Blakeney Gleason, president and treasurer, who presided at the luncheon, speakers included: James E. Gleason, chairman of the board; Samuel B. Dicker, mayor of Rochester; M. Herbert Eisenhart, board chairman of Bausch and Lomb Optical Co.; Thomas J. Hargrave, presidnet Eastman Kodak Co.; Tell Berna, general manager National Machine Tool Builders' Assn.; William Kelly, president Machinery & Allied Products Institute.

Brazil Finds Nitrate Field

Rio de Janeiro—Nitrate, equal in quality to that of Chile, has been found on an estate 18 miles from Corumba, Brazil. No information is yet available on the extent of the deposits but the state laboratory has shown enthusiasm.

Research Council Start Scheduled for May 9 by AISC

Chicago—The Steel Structures Research Council will be activated in Pittsburgh on May 9. It will issue specifications covering practical and economical methods of surface preparation and painting steel structures and recommend steel structure protection improvements.

At a recent Chicago meeting of the American Institute of Steel Construction, sponsors of the new Council, J. E. Jackson, Institute secretary, noted that since steel producers and paint manufacturers operate almost independently of each other, it was necessary for structural steel fabricators to coordinate their activities in a program to make steel a better construction material. He said that the Council was planned with that in mind.

Publication of the AISC draftsman training manual this fall was announced by R. J. Wood of the Mississippi Valley Structural Steel Co., Decatur, Ill. The manual is intended for apprentice draftsmen who are high school graduates.

Other speakers at the meeting included LaMotte Grover, Air Reduction Sales Corp., New York, who spoke on the economical aspects of welded connections, and J. O. Jackson, vice-president, Pittsburgh-Des Moines Steel Co. Mr. Jackson lectured on steel wind tunnels.

Machine Tool Plight Discussed

Chicago—If the mainstays of the machine tool industry—automobile and foreign markets—should waver, machine tool production will slump seriously, said Tell Berna, general manager of the National Machine Tool Builders Assn., at a recent meeting of the American Machine Tool Builders Assn.

Mr. Berna said reports of the industry's prosperity were unsubstantiated and that operations were at 40 pct of capacity. He con-

demned the American practice of writing machinery off the books as an obsolete depreciation method and urged distributors to perk up sales by stressing that savings were forthcoming with the use of new machine tools.

O. W. Johaning, president, officiated.

Prospects for Metallurgical Research Outlined to ASM Meet

Denver—Metallurgical research, which has lagged behind other fields of industrial endeavor, is finally coming into its own according to William E. Mahin, director of research at Armour Research Foundation of Illinois Institute of Technology.

In a speech before the Denver chapter of the American Society for Metals, he said that the metals industry as a whole has not taken advantage of the entire possibility of industrial research. However, at the present time, research in metals is rapidly increasing. Jet aircraft, electric generators, automobiles and even Pullman cars have great need of improved materials.

Mr. Mahin described work going on in the metals research department of the foundation. Among the studies being undertaken are the fluid flow of liquid metals for the foundry industry, an extensive project on arc welding, titanium development and silicon's metallic properties.

There is no question that metallurgy will flourish, Mr. Mahin concluded. "Engineers and researchers in practically every field of science will be turning more and more to the metallurgist seeking answers to their problems of lighter weight, stronger, more corrosion and heat resistant alloys to make possible the creation of their particular brain child."

March Shipments Break Record

New York—Automatic gas water heater shipments were at a history-wide high in March with 175,000 units, 65 pct greater than the March '49 figure of 106,000 units.

Servel Problem Beaten

Evansville, Ind—The word "stumped" has an insecure place in the vocabulary of American industry. Servel, Inc., refrigerator manufacturers of Evansville, had tripped over a stumbling block in a vital process of production.

Servel's refrigerating principle utilizes steel freezer shelf coils which must be protected from corrosion by aluminum. The company wanted to dodge an expensive method of using aluminum shelves formed around the steel coils and worked into the 1950 Servel refrigerators coils directly coated with aluminum and metallically bonded to the aluminum shelf.

The coils needed proper cleaning and surface preparation so that the aluminum coating would adhere properly. Servel's previous standby, pickling, was tried. Other methods were next and were all unsuccessful.

Finally Pangborn Corp. was summoned to devise an abrasive method that would do the job. Pangborn engineers pondered the problem to see if their airless blast cleaning equipment was practicable here. They thought that Rotoblast, airless, centrifugal-type blast cleaning, could prepare the coils for coating.

Tests proved that a 14′ LG Rotoblast Table could do the job and soon conveyers were carrying the coils onto the machines. The surfaces were properly cleaned and prepared and the aluminum coat stuck like magic.

Servel plant engineer Dana S. Cope reported that 85 pct of the pickling processes formerly used had been discontinued. Other savings in compressed air, time, and labor was the springboard for an invigorated advertising and merchandising program which promises price cuts and increased sales, Servel says.

Viewing the News from

The ECONOMIC SIDE

By JOSEPH STAGG LAWRENCE

"Brannan Plan For Industry"

THE *New York Times* of Apr. 16 carries an astonishing story. At a meeting of government agency and industrial executives which took place at the "economic seminar" of "a large New York University" a Brannan Plan for industry was discussed.

Let's get this straight. The object of the Brannan Plan as applied to agriculture is to assure the farmer a minimum price for his product while affording the consumer the full benefit of market competition. The government, i. e., the taxpayer, pays the producer the difference between what the market paid him and what, presumably, might be a fair price to that producer.

The interest in the Brannan Plan for industry arises from the plight of the coal producers. John L. Lewis has pushed the cost of mining coal to a level where it has become the victim of competitive fuels which are not only cheaper but are also free from the productive vagaries of coal.

Instead of reaching for the cause of this problem and subordinating King Lewis to the general public welfare it is now seriously proposed that consumers be paid for using coal, that they receive out of the public treasury the difference between what they pay for coal and the price of the equivalent B.T.U.s which they might be able to get in some other form. It is proposed that this scheme be applied not only to coal but also to steel.

What kind of a bunny is this which our Merlins would pull out of their silk hats? In the first place it is an attempt to protect irresponsible labor leaders from the consequences of their own excesses. The coal industry is currently demonstrating what every honest economist and businessman already knew, namely, that a continuing rise in cost of any product stimulates the search for substitutes, that discovery of such substitutes spells declining employment in the industry ruled by the "successful" labor leader. John L. Lewis has neither the temperament nor the intellictual honesty to go back to his followers and tell them that they are losing their jobs because he has been too "successful." Government subsidies to consumers of coal would take John off the spot.

Entirely aside from the special relief which a Brannan Plan for industry would afford to labor leaders who have grown too big for their breeches, it is a prolific source of other mischief. It would immediately create the need of tariff adjustments to prevent foreign goods from moving in and taking advantage of the price umbrella held by Uncle Sam, as Canadian potatoes are now doing.

Legal minimum prices would afford shelter for the inefficient producer. A free economy with open competitive markets has always been rough on the marginal producer. A price so low that it does not permit him to operate is a peremptory invitation to take his marbles and go elsewhere. While this has elements of particular tragedy, there is no denying that it also accounts for lower prices and gives the consumer the full credit of technological progress and managerial efficiency.

It is this merciless competition precisely which has accounted for rising American living standards and given this country the material pre-eminence which it now enjoys. A Brannan Plan for industry would reverse the wheels of economic progress and make this country look more and more like England under Cripps.

Metallurgist Wins Recognition

Pittsburgh—A Carnegie-Illinois Steel Corp. metallurgist has been elected by the Penn State Chapter of the American Society for Metals to receive the annual David-Ford-McFarland Award for Achievement in Metallurgy.

M. W. Lightner

Max W. Lightner, manager of the research and development division of Carnegie-Illinois' research and technology department, will receive the award at a dinner meeting May 5 at State College, Pa.

The award was established last year as an annual recognition of the Penn State metallurgist who, in the opinion of the award committee, has brought the greatest credit to himself and his alma mater as a metallurgist.

Mr. Lightner received his B. S. degree at Penn State in 1929 and his master's degree the following year at Carnegie Tech. After three years as research engineer on the metallurgical advisory board of Tech, he joined Carnegie-Illinois as a metallurgical assistant at Homestead Works.

He held increasingly important positions at Homestead Works until 1942 when he left to become vice-president of operations of Heppenstall-Eddystone Corp. He returned to Carnegie-Illinois in 1944 and was promoted to his present position in 1945.

Publish Gray Iron Newsletter

Cleveland—First issue of Gray Iron Newsette, a one-page newsletter published by Gray Iron Founders' Society, was released this week.

The bulletin will be distributed periodically to non-member foundries to acquaint them with current society activities. Outlining items of information of interest to foundry executives, the paper will keep non-members up-to-date.

Washington Air Pollution Conference to be Held May 3-5

Washington — Concern on the part of industry and government in regard to air pollution is pointed up by the coming conference which will be held in Washington on May 3, 4, and 5. Need for some sort of concerted action was emphasized by the Donora disaster in 1948 when 20 persons died as a result of a five-day smog over the area.

Dangers Increasing

Air contamination results from many things, ranging from release of toxic gases from industrial operations.

The dangers and problems have been increasing in recent years in proportion to new developments in the chemical, radiological and bacteriological fields. A serious handicap in closing down numerous war plants, for instance, was the disposal of chemical and acid wastes.

Development of the atom bomb created still another problem and the Atomic Energy Commission is becoming increasingly disturbed about probable radiological contamination of the atmosphere as new forms of atomic energy are developed. Even the Agriculture Dept. is concerned because of aerosols and crop dusting.

Sponsored by a government interdepartmental committee, more than 500 persons are expected to attend, at least half of which will be scientists and government experts, not only from the United States but from England. In addition to discussions, about 80 papers will be submitted covering scientific, legal and health problems.

Uranium Possibilities Better

Salt Lake City—Potentialities of the Marysvale, Utah, district as a source of uranium have been greatly expanded by the changing character of the ore being found.

The original surface discovery was autunite, a yellow to green secondary ore which fluoresces under ultraviolet rays. But at a depth of 100 ft the ore has changed to what is believed to be uraninite, or primary pitchblende.

Helping Hand

Chicago — While ice-locked Lake Superior forbids opening of the ore shipping season, the six vessels of U. S. Steel's limestone carrying fleet are already in an active schedule on the Great Lakes. The fleet is operated by the Bradley Transportation Co., a subsidiary. Six idle ore carriers of the Pittsburgh Steamship Co., another subsidiary to U. S. Steel, are carting limestone between lower lake ports and Calcite, Mich.

It is currently being shipped to the Atomic Energy Commission depot at Marysvale from a lease operated by the Vanadium Corp. of America.

Reserves Seen Vast

The new ore is gray in color with bands of darker blue material. It contains pyritic minerals of a sulfide zone character. It does not fluoresce but reacts strongly on a Geiger counter. The bluish bands give the greatest reaction.

If this primary type ore underlies the entire area which is covered by autunite, which extends several miles, the reserves would be tremendous.

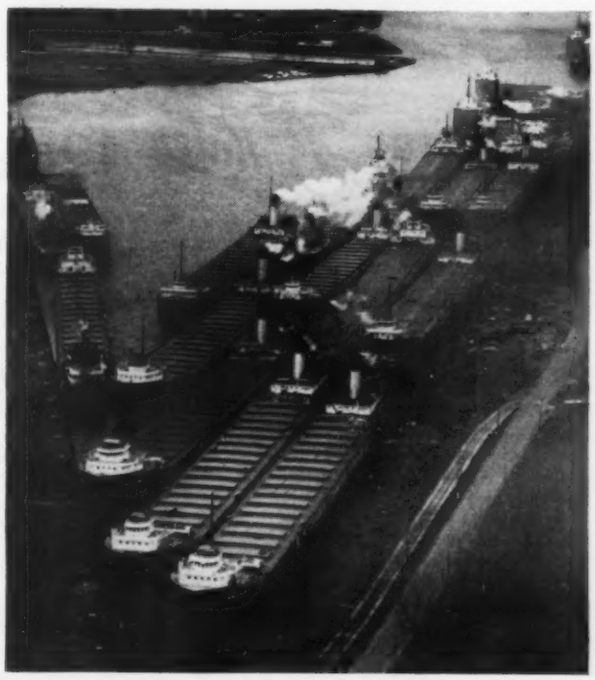
Acme Steel Co. Tells New Product Developments

Chicago—New product developments at the Acme Steel Co. include a new steel reinforcing plate for concrete floors and a patented steel angle for constructing benches and shelves announced Carl S. Sharp, president of the company, at an annual meeting of stockholders held recently.

He reported first quarter earnings of the company to be $1.6 million. This represents an earning of $0.81 per share of stock. Net quarter sales were $16 million.

Mr. Sharp said there would be no point in comparing 1949 last quarter figures with 1950 first quarter figures because of the interruption of production during the steel strike last year. However, the 1950 first quarter earnings compared favorably with the first quarter of 1949.

Acme is in a good position, he added, because its hot and cold rolled strip steel is used by many industries and this diversification results in a market that is less susceptible to peaks and valleys of demand than prevails for such steel items as plates, rails and structurals.



STEAMED UP: Tied up at Milwaukee, massive ore carriers of the Pittsburgh Steamship Co., a U.S. Steel subsidiary, are fired up but empty as they wait breaking up of ice masses on the Great Lakes expected shortly. The 1950 shipping season has been delayed for weeks but mills have adequate stocks on hand.

News of Industry

STEEL CONSTRUCTION NEWS

Fabricated steel awards this week included the following:

3000 Tons, Chicago, Greyhound Bus Terminal to American Bridge Co.

2500 Tons, Camden, S. C., Orlon plant addition, to Virginia Bridge Co., Roanoke, Va.

2050 Tons, Raritan River bridge, New Jersey Turnpike Authority, to Harris Structural Steel Co., New York.

600 Tons, Hollidaysburg, Pa., admissions building for Hollidaysburg State Hospital, McCloskey & Co., low bidder.

310 Tons, Queens, N. Y., apartment house, to Grand Iron Works.

Fabricated steel inquiries this week included the following:

2325 Tons, Middlesex County, N. J., New Jersey Turnpike Authority contract 23, due May 9.

554 Tons, Uxbridge and Douglas, Mass., bituminous macadam surfacing and six bridges on Worcester-Providence highway, Martin J. Dalton, Worcester, district engineer. Completion date June 30.

208 Tons, Lackawanna County, Pa., construction of divided highway and two I-beam bridges, between Factoryville and Clarks Summit. Sec. of Highways, Harrisburg, Pa., bids to May 5.

200 Tons, Steubenville, Ohio, Sears, Roebuck & Co. store, due May 3.

168 Tons, Bucks County, reinforced concrete pavement, seven reinforced concrete structures and three I-beam bridges, Plumstead, Bedminster, Tinicum and Nockamixon Townships, Pennsylvania Department of Highways, to May 12.

130 Tons, Westmoreland County, Pa., construction of reinforced concrete pavement and an I-beam between Leechburg and Edgecliff. Sec. of Highways, bids to May 5.

Reinforcing bar awards this week included the following:

1600 Tons, Middlesex County, N. J., New Jersey Turnpike Authority, Section 1, contracts 3, 3a, 3b, to S. J. Groves & Sons Co., New York.

1110 Tons, Indianapolis, Ind., store building for Equitable Life Insurance Co. to Pollack Steel Co.

510 Tons, Louisville, Ky., distillery to Joseph T. Ryerson and Son, Chicago.

500 Tons, Frankfort, Ky., distillery to Joseph T. Ryerson and Son, Chicago.

500 Tons, Perry County, Pa., Pennsylvania Dept. of Highways, LR 195 (6b), through John Swanger, Inc., Lancaster, Pa., to Bethlehem Steel Co., Bethlehem.

350 Tons, Williamsport, Pa., flood protection project, through Lycoming Construction Co., Williamsport, to U. S. Steel Supply Co., Pittsburgh.

309 Melrose Park, Ill., Des Plaines intercepting sewer to U. S. Steel Supply Co., Chicago.

250 Tons, Montgomery County, Pa., Pennsylvania Dept. of Highways, LR 769, through F. A. Canuso & Sons, Philadelphia, to Bethlehem Steel Co., Bethlehem.

200 Tons, Pottsville, Pa., Pottsville Hospital, to S. H. Evert & Co., Bloomsburg, Pa.

188 Tons, Chicago, Bittersweet aps. to Ceco Steel Products Co., Chicago.

165 Tons, Chicago, Laramie grade separation to U. S. Steel Supply Co., Chicago.

Continued on Next Page

WITH RELIANCE *Job-Fitted* SERVICE

"Your Job's The Thing"

RELIANCE *Job-Fitted* PRODUCTS AND SERVICES

COLD ROLLED STRIP STEEL*

Coils . . . Cut Lengths . . . All Tempers
Slit, Sheared, Deburred
and Round Edge
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**Detroit Steel Strip is Strip Steel in Name and in Fact*

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Galvanized
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dimensions
PRIMES
or COST-SAVING SECONDS**
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WAREHOUSE STOCKS

***Reliance Job-Fitting Methods apply to seconds as well as primes*

No matter how, where or when you buy steel—"Your Job's the Thing".

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In a nutshell, that is the "Job-Fitted" idea on which Reliance Service operates. It begins with a thorough knowledge of the possibilities of our materials. By the same token, an important part of *our* job is to know *yours*, in all its aspects, mechanical as well as economic.

The result—all factors considered, you save production time and/or money.

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Slabs • Sheet Bars • Billets • Wire Rods
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EASTERN PLANT, State & Edmund Sts. (Hamden), New Haven 7-5781, New Haven 7, Conn.
MIDWEST PLANT, 1601 South Wolcott Ave., CAnal 6-2442, Chicago 8, Ill.

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INDIANAPOLIS 4, IND., 1406 Fletcher Trust Bldg., FRanklin 3429
JACKSON 18, MICH., 801 Reynolds Bldg., JAckson 3-3258
NEW YORK 19, N. Y., 250 West 57th St., COlumbus 5-4870
ST. LOUIS 8, MO., 4053 Lindell Blvd., LUcas 4558
TOLEDO 4, OHIO, 2114 Ohio Bldg., GArfield 6364
WORCESTER 8, MASS., 336 Main St., WOrcester 5-0866

128 Tons, Evanston, Ill., apt building Hinman Ave., Carl E. Erickson Contractor.

100 Tons, Lancaster, Pa., research laboratory for Armstrong Cork Co., to H. E. Baton, Philadelphia.

Reinforcing bar inquiries this week included the following:

2100 Tons, Chicago, Veterans Research Hospital, W. E. O'Neill Const. Co. and Kenny Construction Co., both Chicago, low bidders.

1000 Tons, Cleveland, Ohio Foundry for Motor Co.

550 Tons, Plymouth, Mass., bituminous macadam and nine bridges. Completion date June 1, 1951. Lewis R. Sellow, Middleboro, district engineer.

510 Tons, Cedar Rapids, Iowa, St. Luke's Hospital, R. W. Rindernecht, low bidder.

500 Tons, Moorcroft, Wyo., Keyhole Dam, Bureau of Reclamation, Moorcroft, Spec. 2983, bids to May 23.

384 Tons, Coulee Dam, Wash., warehouses A and B, etc., Coulee Dam Division, Bureau of Reclamation, Coulee Dam, Spec. 2985, bids to June 1.

315 Tons, Lakewood, Ohio, St. Edwards' High School.

276 Tons, Santa Clara Co., Calif., highway construction near Los Gatos, California Div. of Highways, Sacramento, bids to May 17.

257 Tons, Los Angeles, bridge for an overcrossing over Hollywood Freeway at Sunset Blvd., California Div. of Highways, Los Angeles, bids to May 18.

225 Tons, Hollidaysburg, Pa., State Hospital.

189 Tons, Bucks County, reinforced concrete pavement, seven reinforced concrete structures and three I-beam bridges, Plumstead, Bedminster, Tinicum and Nockamixon Townships, Pennsylvania Department of Highways, to May 12.

163 Tons, Uxbridge and Douglas, Mass., bituminous macadam surfacing and six bridges on Worcester-Providence highway. Martin J. Dalton, Worcester, Mass., district engineer. Completion date June 30, 1951.

155 Tons, Cedar Rapids, Iowa, stadium.

150 Tons, Westmoreland County, reinforced cement concrete pavement, Derry Township, New Alexandria Borough, Pennsylvania Department of Highways, to May 12.

Sheet Piling Inquiries this week included the following:

274 Tons, Port Hueneme, Calif., U. S. Naval Construction Battalion Center, Yards & Docks Supply Office, Inv. No. 14211, bids to May 3.

Colorado Fuel Offices to Move

New York—Need for more space and desire for strategic business section placement will move the executive offices of the Colorado Fuel and Iron Corp. and its Wickwire Spencer Div. into the entire fourteenth floor of the 25-story Uris Brothers Building, now under construction at 575 Madison Ave., the firm reports. The offices will be moved early in 1951.

For the past 12 years Colorado Fuel offices have been located at 500 Fifth Ave. The new space will contain the New York district sales office of the Wickwire Div.

• *News of Industry* •

Describes New Heat Treatment

Providence, R. I.—"Transverse Flux Induction Heating," a special method of radio-frequency induction heating which permits heat treatment of nonferrous strip like aluminum, brass, copper, stainless steel, etc., was reported by Robert M. Baker, of the Westinghouse Electric Corp. this week.

He spoke at the Wednesday meeting of the North Eastern District of the American Institute of Electrical Engineers in the Sheraton-Biltmore Hotel. Two pilot line installations of the heat treatment method have already been made, Mr. Baker said.

H. F. Robison and W. H. Wickham, of the Commonwealth Edison Co., Chicago, told of a new device providing a faster and easier means of calibrating watthour meters, particularly in field tests.

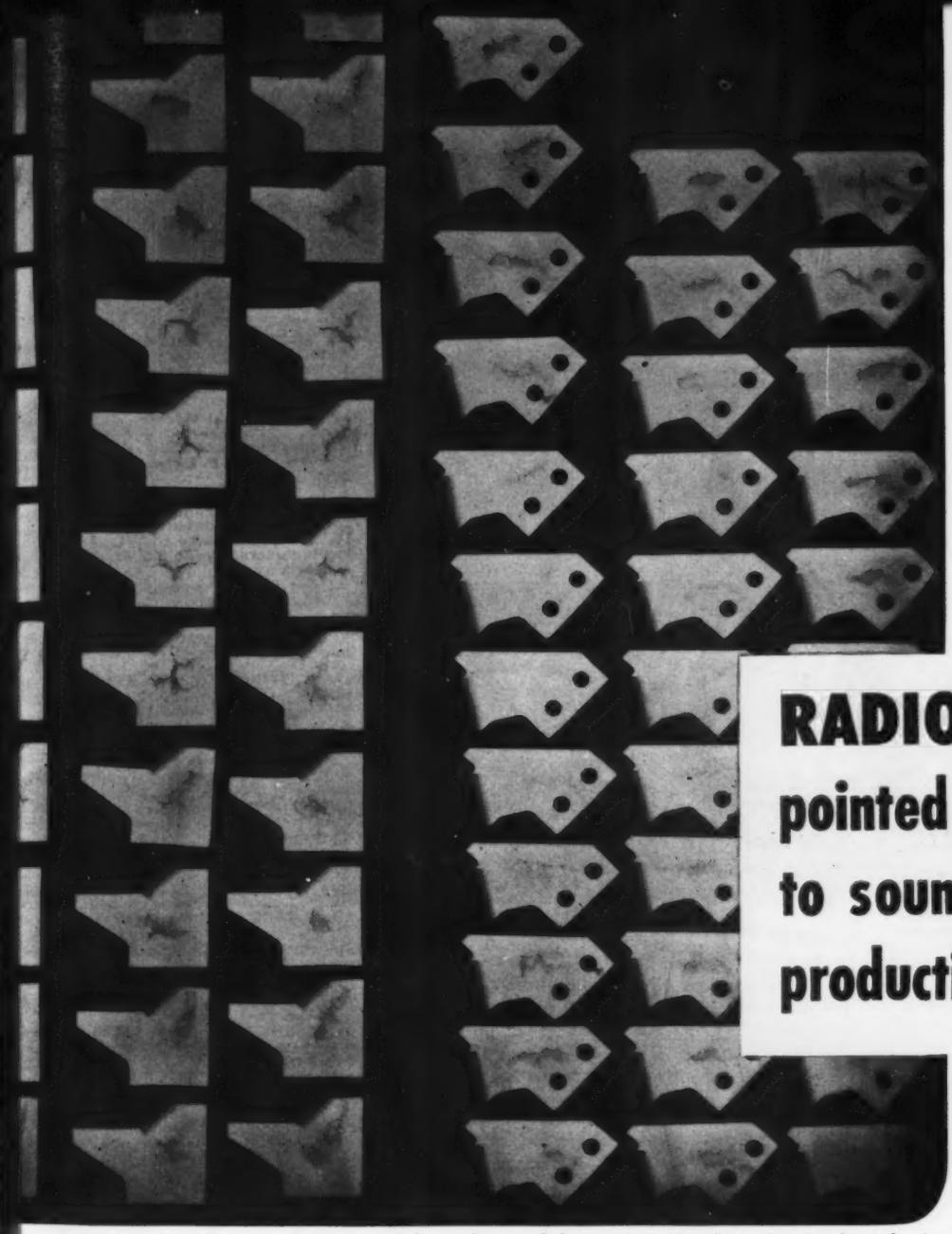
New Spectrograph Installed

Hoboken, N. J.—Spectrographic analysis at the Chemical Div. of the U. S. Testing Co., Inc., will employ a Baird Associates Spectrograph and a Jarrell-Ash Comparator Microphotometer in place of former facilities.

The spectrograph, used for qualitative and quantitative analyses of the widest range of materials, identifies elements in ores, minerals, and metals. The installation of the two instruments now enables the firm's Spectrochemical Laboratory to deal with many problems in emission spectrography.

SKF Oldtimers Honored

Philadelphia — Long-term employees of the SKF Industries, Inc., were feted at a recent luncheon held in the SKF main plant here. William Batt, president, himself on the company roster for 42 years, presented a silver platter to J. R. Doughty, export sales manager, for 40 years' service. Watches for 20 years' service went to Arthur Cheney, James B. Elvin, John P. Maguire, Harry D. George, Harry J. Sizer, William F. Hagen, and Mrs. Grace E. Nicely.



RADIOGRAPHY pointed the way to sound production

Radiography revealed a recurring irregularity in a simple production casting—showing the need for a change in casting procedure.

Simple castings are not always soundly made the first try. These were for a customer who had learned to expect highest quality from the foundry.

The first group cast was checked radiographically. Similar irregularities were found in nearly every part, indicating the need for a change in casting procedure. With the help of radiography the change was made with a minimum of lost time, and sound parts were quickly cast and delivered to the customer.

Any foundry that seeks a reputation for producing consistently sound castings will find radiography an invaluable aid. It detects irregularities. It pictures the effects of changes in gating, venting, pouring temperatures, chilling, and other variables. It pays for itself from savings in development time and in reduced rejections—builds customer good will.

Ask your x-ray dealer to explain all the ways radiography can help you increase yield and cut costs, or ask Kodak for a copy of "Radiography as a Foundry Tool."

EASTMAN KODAK COMPANY
X-ray Division
Rochester 4, N. Y.

Radiography . . .

another important function of photography

Kodak
TRADE-MARK

Dates to Remember

Apr. 27-28—American Steel Warehouse Assn., annual meeting, Shamrock Hotel, Houston. Association headquarters are at 442 Terminal Tower, Cleveland.

May 4-5—National Machine Tool Builders' Assn., spring meeting, Edgewater Beach Hotel, Chicago. Association headquarters are at 10525 Carnegie Ave., Cleveland.

May 8-12—American Foundrymen's Society, annual convention and exhibition, Public Auditorium, Cleveland. Society headquarters are at 222 W. Adams St., Chicago.

May 10-12—Machinery Dealers' National Assn., annual convention, Hotel Statler, Detroit. Association headquarters are at 20 N. Wacker Drive, Chicago.

May 15-17—Industrial Furnace Manufacturers Assn., annual meeting, The Homestead, Hot Springs, Va. Association headquarters are at 420 Lexington Ave., New York.

May 22-24—American Supply & Machinery Manufacturers' Assn., Industrial supply convention, Convention Hall, Atlantic City, N. J. Association headquarters are at 1108 Clark Bldg., Pittsburgh.

May 24-25—American Iron & Steel Institute, annual meeting, Waldorf-Astoria Hotel, New York. Institute headquarters are at 350 Fifth Ave., New York.

May 25-27—Society for Experimental Stress Analysis, spring meeting, Hotel Statler, Cleveland. Society post office address is Box 168, Cambridge, Mass.

May 26-27—Society for Applied Spectroscopy, annual meeting, Socony-Vacuum Training Center, New York. Society secretary is Ruth Abbott, American Cyanamid Co., Bound Brook, N. J.

May 27-30—Gas Appliance Manufacturers Assn., annual meeting, Greenbrier, White Sulphur Springs, W. Va. Association headquarters are at 60 E. 42nd St., New York.

June 1-2—American Society for Quality Control, national convention and midwest conference, Milwaukee Auditorium, Milwaukee. Society headquarters are at 4949 W. 65th St., Chicago.

June 4-9—Society of Automotive Engineers, summer meeting, French Lick Springs Hotel, French Lick, Ind. Society headquarters are at 29 W. 39th St., New York.

June 5-7—American Gear Manufacturers Assn., annual meeting, The Homestead, Hot Springs, Va. Association headquarters are in the Empire Bldg., Pittsburgh.

June 12-16—American Electroplaters' Society in collaboration with the Electrodepositors' Technical Society of England, international electrodeposition conference, Statler Hotel, Boston. Society headquarters are at 473 York Road, Jenkintown, Pa.

June 19-23—American Society of Mechanical Engineers, semiannual meeting, Hotel Statler, St. Louis. Society headquarters are at 29 W. 39th St., New York.

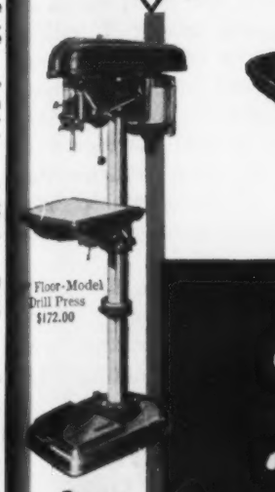
Oct. 23-27—National Metal Congress & Exposition, International Amphitheater, Chicago. American Society for Metals headquarters are at 7301 Euclid Ave., Cleveland.

17" Multiple-Spindle (8) Drill Press - $1579.00

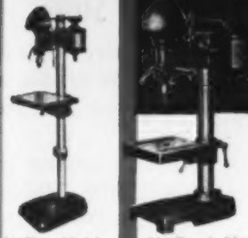
DELTA
MILWAUKEE
®

Single-spindle drill presses ...or batteries a block long!

DELTA® the most complete line



Floor-Model Drill Press $172.00



14" Floor-Model Drill Press $109.00

14" Bench-Model Drill Press $74.00

14" Super-Hi® Drill Press $151.50

17" Floor-Model Power-Feed Drill Press $267.00

17" Bench-Model Drill Press $204.50

Motor and switch extra. Prices subject to change without notice.

TALK about selection! There are 144 different drill presses in the big Delta line. Every one is tops when it comes to drilling — and versatile enough to do over 36 different additional jobs, besides!

Naturally you can find the exact machine your job calls for in such a complete line — with the right number of spindles, the right chuck capacity, the right speed — *and at the right cost!*

There are 14" and 17" models . . . floor and bench types . . . single spindles . . . multiple-spindle batteries . . . individual heads for special set-ups . . . power-feed and foot-feed machines . . . high-speed, super-sensitive models. Speeds range from 80 to 12,000 r.p.m. . . . capacities from .023" diameter to ¾" in cast iron. And, as you know, Delta quality is always the best.

What's more, you get this *same* wide selection in 42 other machines besides drill presses. Altogether, they make *Delta* the industry's most complete line of metalworking and woodworking machines. It's the only line with complete accessories to make every tool do more jobs — and often save you an investment in other machines.

That's why it pays to look to Delta first — for the right machine to do your job right. Send coupon for catalogs and bulletins on the entire Delta line.

POWER TOOL DIVISION
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Manufacturing Company
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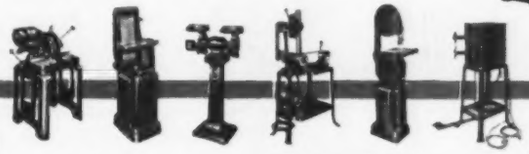
DELTA • MULTIPLEX • CRESCENT • HOMECRAFT
Sold only through authorized dealers. Easy time-payments!

Look for the name of your Delta dealer under "Tools" in the classified section of your telephone directory.

Tear out coupon and mail today!



Plus a complete selection of:

3 Cut-Off Machines · 2 Abrasive Finishers · 5 Grinders · Deburring Machine · 3 Band Saws · 3 Welders

6 Circular Saws . . . 4 Jointers . . . Scroll Saw . . . 4 Radial Arm Saws . . . 2 Shapers . . . 2 Saw-Jointer Combinations . . . Mortiser . . . Lathe . . . 2 Buffing Machines . . . 2 Planers. **53 Machines — 246 Varieties**

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Send me free catalogs and bulletins on the complete Delta line.

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M-47

March Steel Output About 1 Million Tons Under '49 Month

New York—America's steel furnaces operating at 88.2 pct of capacity in March produced 7,446,307 net tons. It was an increase of 653,062 tons over the 6,793,245 tons made in the short month of February and nearly 1 million tons under the record production in March, 1949, of 8,387,927 tons.

Despite production hamstringing during the coal shortage, steel made in the first quarter was 22,169,924 tons—surpassed only by first quarter production in 1949 and wartime 1944.

Furnaces burned at 89.1 pct of capacity during February. Average first quarter operations were 90.4 pct of capacity against 101.5 pct a year ago.

Chrysler Sales Figures Indicate Toll of Long Strike

Detroit—The Chrysler strike is taking its toll from the dealers as well as the producers and the workers.

Based on reports compiled by the Detroit Automobile Dealers Assn., sales of Dodge, DeSoto and Plymouth in Wayne Co. are off 22 pct, 25 pct and 54 pct respectively during the first three months of 1950. Unit sales by Chrysler Div. dealers show a slight gain of 2 pct despite the prolonged strike.

Company spokesmen have pointed out that sales figures for the first 3 months are on the optimistic side since cars on hand at the time the strike was called have been the only source of new automobiles for the dealers for 2 months. It has been pointed out that a considerable lag in deliveries will inevitably follow a settlement of the Chrysler strike.

Reports compiled by Ward's service show that during the first 3 months of 1950 Chrysler produced 111,024 cars compared with 244,284 for the same period a year ago. Last year at this time Chrysler was enjoying 16.8 pct of the passenger car business. The Chrysler percentage for 1950 is only 6.4 pct.

It's A SURPRISE PACKAGE

When it comes to low-cost painting, Barreled Sunlight is really a surprise package . . . *to those who have never used it before.*

We agree, Barreled Sunlight costs more per gallon *in the can.* But is *that* important? No! . . . not by a long shot . . . not when you figure paint in terms of what it costs you *on the wall.*

That is why we ask cost-conscious men to compare *thoroughly* Barreled Sunlight with any other brand of paint. Just take a gallon can of each. Thin according to directions and see how much *more* paint *ready for the brush* you get from a can of Barreled Sunlight. Then apply each to a wall. Note the extra yardage you get from Barreled Sunlight and how brighter, cleaner it looks after drying. And, *because labor represents 80% of the total cost of a painting job* see how much *less time* it takes to apply Barreled Sunlight properly.

With a fair test like this, you'll soon see that for effective, *economical* painting, Barreled Sunlight is the "Surprise Package," the paint that works best for less . . . less paint, less labor, less cost for the finished job.

Talk it over with our representative. Write and he'll gladly call.

U. S. GUTTA PERCHA PAINT COMPANY
11-D Dudley St., Providence, R. I.

AMERICAN TEXTILE MACHINERY EXHIBITION ATLANTIC CITY MAY 8-12, 1950

Booth 262

Barreled Sunlight *Paints*

In whitest white or clean, clear, pleasing colors, there's a Barreled Sunlight Paint for every job

IT ALWAYS COSTS MORE NOT TO PAINT!

Urges Anti-Sub Training For Caribbean to Protect Ore Lines

Admiral wishes to counteract fund cuts by broadening defense pact

San Juan, Puerto Rico — Anti-submarine training by U. S. Naval training units in this island territory for each of the Caribbean nations is strongly urged by Rear Admiral Daniel E. Barbey, USN, Commander Caribbean Sea Frontier, to counteract drastic cuts in naval forces in this area. These cuts (THE IRON AGE, Mar. 23, p. 79) would seriously endanger vital supply lines for bauxite, iron ore and oil in the event of war.

Admiral Barbey would extend the regional mutual defense pact of the Caribbean Republics to include the Caribbean Dependencies, so that each of these regions would be responsible for the defense of a specific portion of the entire area.

Economy Cuts Strength

Speaking to a group of reserve naval officers, Admiral Barbey pointed out that "the Navy is withdrawing its strength from the Caribbean for reasons of economy. Available forces must be kept in the forward area. If war should come in the immediate future, our probable enemy may be expected to institute a submarine campaign to destroy the oil refineries and installations in the Netherlands West Indies and Venezuela, and to interrupt the shipping of bauxite, oil and sugar through the Caribbean."

With proper training the countries bordering on the Caribbean can take on the responsibility for protection of shipping throughout this area, according to Admiral Barbey. He believes that such a program would give real meaning to the inter-American training envisaged under the Rio and Bogota Pacts.

Sloss-Sheffield Income Drops

Birmingham — Sloss-Sheffield Steel & Iron Co.'s net income for the first quarter of 1950 after estimated Federal income taxes was $579,209.58.

User Reports . . .

N-B-M #397 SILVER BABBITT LASTS 5 TIMES AS LONG!

Large Portland Cement Plant used N-B-M Silver Babbitt on Crusher Bearings. Result? 400% *longer bearing life . . .* 30% *lower babbitt cost!*

The superintendent of this cement plant was —in his own words—"naturally skeptical" when quoted the low original cost of N-B-M #397 Silver Babbitt, compared to a tin-base babbitt then being used. But, later he writes:

"We are happy to say the #397 Silver Babbitt has already given us 4 to 5 times the service of the other metal. We believe the record speaks for itself."

These big savings—*in both original cost and actual service cost*—are possible because #397 Silver Babbitt costs 30% to 40% less than tin-base babbitt—yet has these important features that insure easy handling and better bearing performance:

- **Retains hardness at higher temperatures**
- **Easy to bond**
- **Has high resistance to corrosion**
- **Embeds grit—even at room temperature**

N-B-M Silver Babbitt offers plant and product engineers this real challenge: *chances are that it can make important savings in your plants or products.* Investigate it now—write today for complete information and prices!

This folder gives complete facts . . . Lists physical properties and operating characteristics of N-B-M Silver Babbitt. Engineering Brief gives instructions on preparation of shells for good bonding, and pouring. Be sure to ask for your free copy!

Please send me your free folder on N-B-M Silver Babbitt . . .

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Title.....

Company.....

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AMERICAN Brake Shoe COMPANY

NATIONAL BEARING DIVISION

4923 Manchester Avenue • St. Louis 10, Mo.

PLANTS IN: ST. LOUIS, MO. • MEADVILLE, PA. • NILES, OHIO • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

• *News of Industry* •

Canada Ingot Production At Highest Peak Since May '49

Toronto — Canadian production of steel ingots and castings in January attained the highest monthly rate since May 1949, with output totalling 289,949 net tons for a daily average of 85.3 pct of capacity.

December production amounted to 263,949 tons or 77.6 pct, and for January 1949 a total of 284,707 tons were produced.

Charges to steel furnaces in January this year included 141,154 tons of pig iron; 84,270 tons of scrap of consumers' own make and 88,284 tons of purchased scrap.

Careers in Metallurgy Explained in ASM Recording

Cleveland — American Society for Metals has completed a 30-minute recording of "Your Career in Metallurgy," produced as one of the projects of the Society's advisory committee on metallurgical education, ASM announced here.

The recording dramatizes the story of metallurgy, from blacksmithing to the sound of a jet plane.

Purpose of the recording is to clarify metallurgy in the minds of students who want an engineering career but who have not decided on the particular branch they will enter.

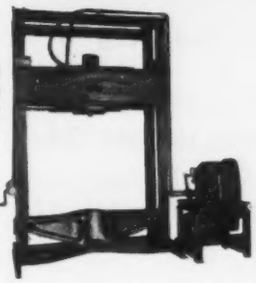
The recording is available to colleges and high schools, according to the ASM announcement.

OK Europe Steel Facility Funds

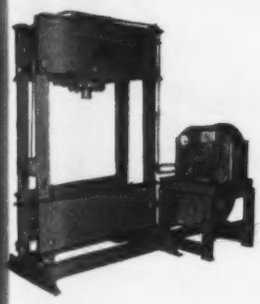
Washington — Installation of a reversing cold sheet rolling mill at Linz, Austria, and modernization of magnetic sheet facilities at Terni, Italy, have been okayed by the Economic Cooperation Administration.

The new cold mill at Linz is the first Austrian mill of its kind. Producing 66-in. sheets, it will produce 50,000 tons a year although the capacity is rated at 80,000 tons.

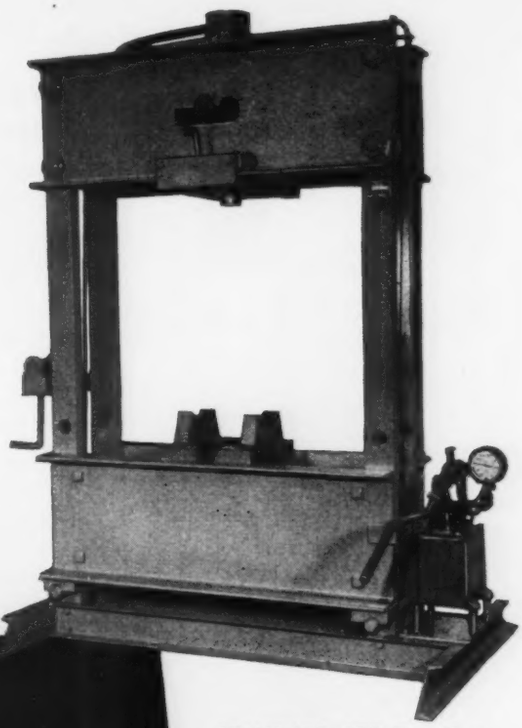
The ECA will contribute about $2 million of the total cost of $3.7 million.



SPECIAL 150 Ton Open Yoke Vertical Press with adjustable head member and double-acting cylinder.



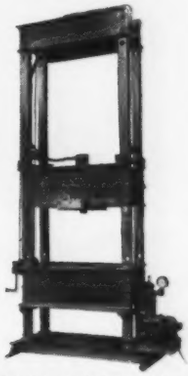
STANDARD 200 Ton Shop Press with 4-Cylinder Power Pump and double-acting cylinder.



...THE FINEST PRESSES FOR THOSE 101 SHOP JOBS

Rodgers
100, 150 AND 200 TON SHOP PRESSES

STANDARD 150 Ton Shop Press with new Rodgers 4-Speed Hand Pump capable of producing 10,000 psi. maximum pressure.



SPECIAL 150 Ton Shop Press featuring a 96" opening with adjustable head and bolster.

Fast, Versatile Hydraulic Presses With Hand or Power-Driven Pumps

HERE are versatile, time-saving presses you can use in a hundred ways — the Rodgers 100, 150 and 200 Ton Hydraulic Shop Presses, operated with your choice of the new 4-speed Hand Pump or Power Pump.

The standard 100, 150 and 200 Ton Units include many construction and operating features — the cylinder is movable across entire width of upper head member — Two-way Travel Cylinders can be used when necessary to return heavy dies — Sturdy Press Frame permits full pressure to be applied anywhere across 48" width of lower bolster — Bolster adjusts from 12" to 36"—and there are open ends between uprights to accommodate long material extending through.

If specifications on the standard models don't meet your requirements, we'll modify them or build a special press as required.

There are standard model Rodgers Shop Presses in 60, 80, 100, 150, 200, 300 and 400 Ton Capacities!

SEND FOR CATALOG...

New Catalog 313 has descriptions and specifications on the complete line of shop presses.

HYDRAULICS Rodgers THE WORLD OVER

Rodgers Hydraulic, Inc.

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HYDRAULIC POWER EQUIPMENT

• *News of Industry* •

Round Associate Companies Add Newly-Formed Southern Link

Birmingham—Another link, The Southern Chain & Mfg. Co., of this city, has been welded to the Round Associate Chain Companies. With offices and plant-warehouse at 1224 Second Ave., North, Birmingham, the newly organized firm will function as an independent concern but will distribute Round products, reported James W. Dickey, vice-president and general manager of Round.

Southern's general manager is A. J. Willingham, Jr., formerly with the U. S. Pipe & Foundry Co. and Moore-Handley Hardware Co. President is Raymond L. Round, who holds similar posts in all Round companies. Mr. Dickey will serve as vice-president and treasurer.

He said that forming the company was the initial stride in Round's southern expansion program and through arrangement with the Cleveland Chain & Mfg. Co., another affiliate, emergency needs of its customers will be shipped by Southern.

To Install 59 Oven Battery

Pittsburgh—Adding a new battery of 59 ovens will increase coke-making capacity of the Aliquippa, Pa., plant of the Jones and Laughlin Steel Corp. by about 20 pct early in 1951.

The new ovens will add 1433 tons per day to the carbonizing capacity of the plant which is now at 7050 tons of coal a day with the existing 293 ovens. They will be installed by Koppers Co., Inc. Project cost is estimated at $4 million and will include an extension of the boiler plant and alterations to coal handling equipment.

Aro Holds Wall Street Exhibit

New York—A one-firm-exhibit of products was held by the Aro Equipment Corp. on Apr. 19-20 at 37 Wall St., on the Main Banking Floor. It was believed to be the first exhibit of its kind held in Wall Street.

YOU CAN BE **SURE**.. IF IT'S

Westinghouse

..with the type ASR Synchronizing Relay

Getting the motor started right every time—and providing complete protection at all times—are the basic functions of the new Westinghouse SLIPSYN Synchronous Motor Control.

Heart of the new SLIPSYN is the amazing Type ASR synchronizing relay. Characterized by its extremely simple, sturdy and reliable design, this new relay is especially suited for heavy industrial service.

The ASR not only applies the field at the proper speed, but also at a favorable rotor position for best synchronizing performance. It is easily adjusted on the job for best operating conditions under actual load.

**Trade Mark*

SLIPSYN is the name applied to the complete line of Westinghouse Synchronous Motor Control. Standard types are available for operating and protecting all types of synchronous motor drives. Find out all the advantages of SLIPSYN controls now. Call your nearest Westinghouse office or write for Booklet B-4379. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

J-21588

Westinghouse
SLIPSYN
SYNCHRONOUS MOTOR CONTROL

• *News of Industry* •

Six Industries Buy More In February Despite Shipment Drop

New York—Contrary to the general steel shipments slump in February 1950, six industries purchased more steel that month than in February 1949, reported the American Iron and Steel Institute.

The industries were: automotive, oil and gas; containers; bolts, rivets and screws; contractor's products, such as plumbing and hardware; and furniture, office supplies, and sporting goods.

Autos Still Best Customer

In February the automotive industry still ranked as steel's best buyer, taking 21.5 pct of shipments, as compared with 21.7 pct in January and 17.4 pct in February 1949. Jobbers and dealers for smaller business enterprises took 16.2 pct of total February steel, as compared with 15.4 pct a year ago.

Total February shipments were 5,134,780 tons, as compared with 5,482,691 in January and 5,519,928 in February last year. The coal strike hindered February production.

Produces New Surface Loader

Salt Lake City—Eimco Corp. of Salt Lake City, which manufactures an underground mine loader which is used in all parts of the world, has started production of a new surface loader. It operates on crawlers and the loading scoop, instead of swinging horizontally in a half circle, "rocks" over the head of the operator and deposits the load in a truck directly behind the loading machine.

Advocates Lowered Tariffs

New York — Speaking at the spring meeting of the American Society of Mechanical Engineers in the Hotel Statler recently, William C. Foster, deputy administrator of the Economic Cooperation Administration, said that American artificial trade barriers were impeding European efforts to close their dollar gap.

Kaiser Fontana Mill Makes 1 Million Tons Steel Per Year

Los Angeles—Henry J. Kaiser reported recently that his Fontana steel mill now is turning out 1 million tons of steel a year and is running now at 110 pct of rated capacity.

Officials of Kaiser Steel Corp. claim that they are oversold on plate, continuous weld pipe, cold strip and skelp and that contracts indicate the mill will operate at capacity at least through 1950.

Industry In Good Shape

"We could book substantial tonnages on our two new units, the 86-in. hot strip mill and the electric weld pipe mill, but we are unable to make any commitments to the trade due to the lack of steel available for these mills," says C. F. Borden, general sales manager.

At another press conference, Mr. Kaiser said, "The basic industries are in good shape and the business trend comes from basic industries."

Speaking of the Kaiser aluminum rolling mill at Trentwood, Wash., he said, "We're allocating aluminum. Last month alone we sold and delivered 30 million lbs of aluminum." This is a new, all-time record for the mill.

Mr. Kaiser said he expects to begin production of autos again in the Long Beach plant, probably working up to a production of 400 cars a day. Kaisers, Frasers and the new low-priced, still un-named auto will be turned out. It has previously been reported that assembly of Kaiser and Fraser cars would also begin in Portland, Ore., about June at the rate of 20 units per day.

GM Truck Div. Has Record Month

Detroit—General Motors Truck and Coach Div. set an all-time monthly production record during March, according to Roger M. Kyes, general manager.

March production totaled 11,161 units. The best previous month was 9394 set in August 1948, Kyes reported.

U. S. Survival in War Seen Reliant on Domestic Ore Supply

Cleveland—If the United States is to survive another future world war, its major ore requirements must be based on a domestic supply even at higher cost, John J. Craig, supervising consultant, iron and steel division, Arthur G. McKee & Co., told the Cleveland Engineering Society here.

"If we are going to produce between 87 and 90 million tons of ingots annually, we will need 100 million tons of iron ore a year," Mr. Craig pointed out.

Lake Superior Ore Less

"By 1960, the Lake Superior district will be supplying only 60 pct of this amount," he warned. "The rest of our requirements will be made up of about 10 pct magnetic taconite concentrate and about 30 pct imported tonnage, primarily from Labrador and South America," he indicated.

However, concentration costs money, roughly seven times as many men are required to produce a given tonnage of magnetic taconite concentrate as are required to mine an equivalent tonnage of open pit iron ore, Mr. Craig declared.

Pig Iron Rate Marks Record

Toronto—Canadian pig iron production in January was at the highest monthly rate since June 1949. Output for the month amounted to 190,432 net tons or daily average of 81.6 pct of capacity and compares with 172,002 tons or 73.7 pct for December and 183,074 tons or 78.5 pct for January 1949.

For the month under review output included 151,403 tons of basic pig iron of which 141,543 tons were for further use of producers and 9860 tons for sale; 21,845 tons of foundry iron of which 340 tons were for further use and 21,505 tons for sale, and 17,184 tons of malleable iron of which 102 tons were for further use and 17,082 tons for sale.

• *News of Industry* •

U.S. Rubber, CIO, Agree On New Pension Schedule

Detroit — Approximately 33,000 workers are included in a new plan providing $100 monthly pensions which has been agreed upon by the United States Rubber Co. and the United Rubber Workers (CIO).

The agreement establishes $100 pensions, including social security, for persons retiring at 65 with 25 years' service. The plan also provides for a $2000 life insurance policy for each employee and a minimum pension of $60 for totally disabled workers after 20 years' service.

Subject to ratification is the plan to replace a system set up in 1927 which provided a top pension of $80.

The agreement affects workers in 19 U. S. Rubber plants, including 5400 employees at the Detroit plant.

Ford Motor Co. Looking For 'Quality Queen' Among Employees

Detroit—Ford Motor Co. is holding a company-wide contest to select a "Quality Queen." Employees will submit photographs of any hourly-rated woman employee of the company for the contest. The wife, daughters and sisters of hourly-rated employees may also enter but must live in the home of an employee.

The five best entries will be selected by a group of judges headed by John Powers, widely-known model agency owner. Entries close May 5.

British Oil Gas Patent Awarded

Cleveland — Gas Machinery Co. has been awarded a basic patent for the production of oil gas, by the British patent office, according to a company announcement here.

The patent covers the production of oil gas using various types of process oil with oil as a fuel for heating. Processes described under the patent are similar to those which have been installed in the U. S. and Canada in recent years by Gas Machinery Co.

MARKET

Briefs and Bulletins

still ice-locked—Worst ice conditions in the upper lakes since 1907 may postpone opening of navigation from the head of the lakes for another three weeks, Great Lakes shippers reported. While no overall shortage of iron ore exists, some consumers are short of certain grades and tonnage is being traded to balance stocks. Stocks on hand Apr. 1 totaled 20,864,766 gross tons. According to a recent report of Lake Superior Iron Ore Assn. consumption at the March rate has probably reduced these stocks to about 15,500,000 gross tons. However, movement from Escanaba, Mich. has been underway since Apr. 22, and 17 ore carriers were scheduled for loading this week.

cartel plotters—A former official of Henry Wallace's Progressive Party and a former Justice Dept. representative with the U. S. Government in Germany, James M. Martin, charged before a Congressional committee this week that U. S. Steel, Bethlehem, and Republic Steel were engaged in "flagrant violation of the anti-trust laws and in collusive price-fixing" before World War II. The committee was also told that the pattern set by the prewar international steel cartel has never been broken and that plotters are working to revive it.

demand warms up—Balmy days in the offing are creating a slight increase in demand for structurals in the Chicago area. Strong demand for bars is expected to run into the third quarter here, upsetting some gloomy predictions. Floor plate is now moving as quickly as other products and electrical sheets finds itself in a similar plight. In wire products, fence, and barbed wire are in heaviest demand here, trailed by nails, steel posts.

production to climb—Improved production facilities at Inland Steel Co. is expected to boost capacity figures from 3.4 to 3.8 million tons annually. The increase will come either at the end of the first half or at the end of the year.

price revision—The price of 10-gage galvanized sheets has been revised downward $5 per ton within the past 2 weeks by two Pittsburgh warehouses. The new price is $6.45 per 100 lb.

won't say—Spokesmen for Republic Steel Corp. declined to comment on a report that Republic is negotiating for lease of a possible source of manganese ore in Aroostock County, Maine.

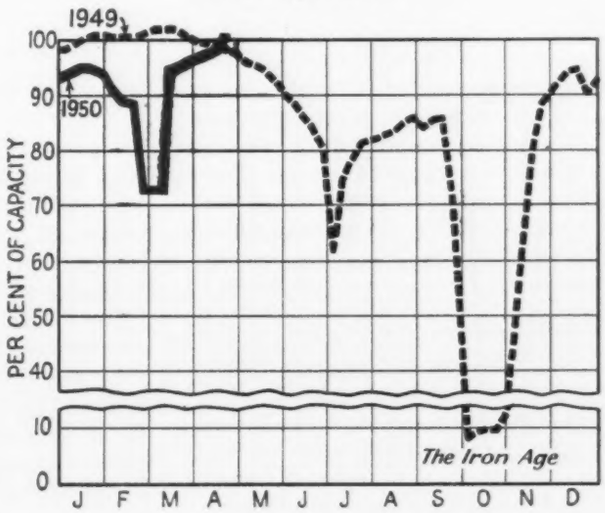
always hungry—U. S. and Canadian blast furnaces consumed 5,947,807 gross tons of Lake Superior district iron ore in March as compared with 5,329,000 tons in February and 7,734,760 tons in March '49, reports the Lake Superior Iron Ore Assn. Total 1950 consumption by the end of March had reached 18,016,854 tons against 22,317,656 for the corresponding period last year. Iron ore in stock was 20,864,766 as of Apr. 1, well over the 17,308,374 ton figure last year.

conversion pains—Tonnage of conversion ingots grows and some disgruntled murmurs are heard that it is not up to par as far as quality is concerned. Steel mills are faced with the temptation to treat conversion ingots as an unwanted stepchild and many have refused outrightly to add aluminum to improve drawing quality. It is generally unheard of for a mill to voluntarily aluminize a conversion ingot.

warehouse sold—The Philadelphia warehouse of Edgar T. Ward Sons Co., a division of Columbia Steel & Shafting Co., has been sold to Peter A. Frasse & Co. Effective date of sale was Apr. 24.

acid steel—Acid open hearth steel melted in 1949 totaled 866,614 tons, of which 46.37 pct was in ingots and 56.63 pct, castings.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
April 16	99.0*	105.5*	90.5	84.0	95.0*	104.0	106.0	104.0	101.0*	97.0	87.0	79.8	127.0	100.0*
April 23	100.5	104.0	90.5	84.0	98.0	104.0	104.0	104.0	100.0	99.0	92.0	78.0	106.0	100.5

* Revised.

Nonferrous Metals OUTLOOK

Market Activities

by John Anthony

Metals demand continues after price advances . . . Fabricated backlogs build up further in March . . . Lead consumers start to build up inventories . . . Tin coasts

NONFERROUS METALS PRICES

	Apr. 19	Apr. 20	Apr. 21	Apr. 22	Apr. 24	Apr. 2
Copper, electro, Conn.	19.50	19.50	19.50	19.50	19.50	19.5
Copper, Lake, Conn.	19.625	19.625	19.625	19.625	19.625	19.6
Tin, Straits, New York	77.00	77.50	77.625	....	77.00	76.7
Zinc, East St. Louis	11.00	11.00	11.00	11.00	11.00	11.0
Lead, St. Louis	10.30	10.55	10.55	10.55	10.55	10.5

Note: Quotations are going prices.
* Tentative.

New York—The price advances in copper, lead and zinc last week served to stimulate demand for metals, bringing the more cautious buyers into the market for heavier tonnages. Producers of copper have been making record-breaking deliveries, for which mine production has been stepped up and inventories of refined copper have been worked almost into the ground. There is no margin to permit further increase in deliveries.

Mill Business Up

The March statistics of fabricators show a further build up of unfilled sales of products (4,500 tons increase during the month) to 200,495 tons, in terms of copper contained. This backlog is greater than any since last July. Copper consumption in March was 106,644 tons, nearly 4,000 tons higher than in the short month of February. Fabricators' stocks of refined copper are growing rapidly. The March tonnage of 381,107 tons showed an increase of more than 17,000 tons. But undelivered purchases of copper dropped more than 12,000 tons to 79,517 tons. With working stocks of 293,311 tons, there was a deficit of 33,182 tons of copper for the tonnage of products booked.

The ½¢ advance in the price of zinc was the fourth in a period of little more than a month, for a total of 1¼¢ per lb. Demand from die casters and galvanizers continues very strong. The high rate of auto production, despite the Chrysler strike, and building operations, offers no promise of a let up in demand. Now buyers are tending to throw caution to the winds to build up inventories before further rises occur.

Lead producers are cutting into their inventories to meet the rapidly growing market. Consumers who have been carefully operating on a hand to mouth basis are anxious now to build up their working inventories. Assured of a fairly stable market for the time, buyers are generally interested in the fixed price basis.

Small Tin Orders

The tin market is coasting along on small lot orders, and fluctuating mainly on a trading basis. There has been very little change in the price since a week ago. RFC has announced that the tin quotations appearing in any daily metal publication or trade journal approved by RFC would be acceptable for determining provisional and final payment on its sales of tin. The purchaser must select the desired publication when his offer to purchase is made, after which the choice is irrevocable.

MILL PRODUCTS

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 26.9¢; 4S, 61S-O, 28.8¢; 52S, 30.9¢; 24S-O, 24S-OAL, 29.8¢; 75S-O, 75S-OAL, 36.3¢; 0.081 in., 2S, 3S, 27.9¢; 4S, 61S-O, 30.2¢; 52S, 32.3¢; 24S-O, 24S-OAL, 30.9¢; 75S-O, 75S-OAL, 38¢; 0.032 in., 2S, 3S, 29.5¢; 4S, 61S-O, 33.5¢; 52S, 36.2¢; 24S-O, 24S-OAL, 37.9¢; 75S-O, 75S-OAL, 47.6¢.

Plate: ¼ in., and heavier: 2S, 3S, F, 23.8¢; 4S-F, 26¢; 52S-F, 27.1¢; 61S-O, 26.6¢; 24S-F, 24S-FAL, 27.1¢; 75S-F, 75S-FAL, 33.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 33.6¢ to 64¢; 11 to 13, 34.6¢ to 76¢; 23 to 25, 36.7¢ to $1.05; 35 to 37, 44¢ to $1.53; 47 to 49, 63.5¢ to $2.20.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 34¢ to 30.5¢; Cold-finished, 0.375 to 3 in., 2S, 3S, 36.5¢ to 32¢.

Screw Machine Stock: Rounds, 11S-T3, R317-T4; ⅛ to 11/32 in., 49¢ to 38¢; ⅜ to 1½ in., 37.5¢ to 35.5¢; 1 9/16 to 3 in., 35.5¢ to 32.5¢; 17S-T4 lower by 1¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.; 2S, 36¢ to 26.5¢; 52S, 44¢ to 32¢; 56S, 47¢ to 38.5¢; 17S-T4, 50¢ to 34.5¢; 61S-T4, 44.5¢ to 34¢; 75-T-6, 76¢ to 55¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed)

Sheets and Plate: Ma, FSa, ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-$1.01; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher. Base: Up to ¾ in. diam., 10,000 lb; ¾ in. to 1¾ in., 20,000 lb; 1¾ in. and larger, 30,000 lb.

Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢; 1¼ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher. Base: Up to ¾ in. diam, 10,000 lb; ¾ in. to 1¾ in., 20,000 lb; 1¾ in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangle: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 3.5 in., 55¢ 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ lb to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam. in., 0.049 to 0.057, ¼ to 5/16, $1.14; 5/16 to ⅜, $1.02; ½ to ⅝, 76¢; 1 to 2 in., 65¢; 0.065 to 0.082, ⅜ to 7/16, 85¢; ⅝ to ¾, 62¢; 1 to 2 in., 57¢; 0.165 to 0.219, ⅝ to ¾, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher. Base, OD in in.,: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and bars	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blocks	..	40

Copper, Brass, Bronze

(Cents per lb, freight prepaid on 200 lb)

	Sheets	Rods	Extruded Shapes
Copper	33.18	....	32.78
Copper, h-r	....	29.03	....
Copper, drawn	....	30.28	....
Low brass	31.07	30.76	....
Yellow brass	29.61	29.30	....
Red brass	31.56	31.25	....
Naval brass	34.26	28.32	29.57
Leaded brass	....	23.99	28.02
Com'l bronze	32.58	32.27	....
Manganese bronze	37.76	31.67	33.23
Phosphor bronze	50.90	51.15	....
Muntz metal	32.48	28.04	29.29
Everdur, Herculoy, Olympic, etc.	37.93	34.87	....
Nickel silver 10 pct	40.51	42.69	47.46
Arch. bronze	....	....	28.02

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	17.00
Aluminum pig	16.00
Antimony, American, Laredo, Tex.	24.50
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be	$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	$56.00
Bismuth, ton lots	$2.00
Cadmium, del'd	$2.00
Cobalt, 97-99% (per lb)	$1.80 to $1.87
Copper, electro, Conn. Valley	19.50
Copper, lake, Conn. Valley	19.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$100 to $110
Lead, St. Louis	10.55
Lead, New York	10.75
Magnesium, 99.8+%, f.o.b. Freeport Tex., 10,000 lb	20.50
Magnesium, sticks, 100 to 500 lb	36¢ to 38¢
Mercury, dollars per 76-lb flask f.o.b. New York	$70 to $73
Nickel, electro, f.o.b. New York	42.97
Nickel oxide sinter, f.o.b. copper Cliff, Ont., contained nickel	36.25
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$66 to $69
Silver, New York, cents per oz.	71.75
Tin, New York	76.75
Zinc, East St. Louis	11.00
Zinc, New York	11.72
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	17.75-18.25
No. 120	17.25-18.25
No. 123	16.75-17.75
80-10-10 ingot	
No. 305	22.25
No. 315	20.25
88-10-2 ingot	
No. 210	28.25
No. 215	25.75
No. 245	19.25-21.50
Yellow ingot	
No. 405	15.00-16.50
Manganese bronze	
No. 421	21.25

Aluminum Ingot

(Cents per lb, of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	18.25-18.75
0.60 copper, max.	18.00-18.50
Piston alloys (No 122 type)	16.50-17.00
No. 12 alum. (No. 2 grade)	16.00-16.50
108 alloy	16.50-17.00
195 alloy	17.50-18.00
13 alloy	18.50-18.75
AXS-679	16.75-17.25
Steel deoxidizing aluminum, notch-bar granulated or shot	
Grade 1—95-97½%	17.50-18.00
Grade 2—92-95%	16.50-17.00
Grade 3—90-92%	15.50-16.00
Grade 4—85-90%	15.00-15.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	35⅛
Electrodeposited	29⅝
Rolled, oval, straight, delivered	33
Forged ball anodes	34
Brass, 80-20	
Cast, oval, 15 in. or longer	31
Zinc, oval, 99.886, f.o.b. Detroit	17¼
Ball anodes	16¼
Nickel 99 pct plus	
Cast	59.00
Rolled, depolarized	60.00
Cadmium	$2.15
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	79½

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	46½
Copper sulfate, 99.5 crystals, bbl.	12.00
Nickel salts, single or double, 4-100 lb bags, frt allowed	18.00
Nickel chloride, 300 lb bbl	24.50
Silver cyanide, 100 oz lots, per oz	61¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc sulfate, 89 pct granular	7.15
Zinc cyanide, 100 lb drums	38.00

SCRAP METALS

Brass Mill Scrap

(Cents per pound; add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	16½	15¾
Yellow brass	13⅜	12⅛
Red brass	15	14¼
Commercial bronze	15¼	14½
Manganese bronze	12⅜	11⅞
Leaded brass rod ends	13	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	16.00-16.25
No. 2 copper wire	15.00-15.25
Light copper	14.00-14.25
Refinery brass	14.75*
Radiators	10.50

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	16.00-16.25
No. 2 copper wire	15.00-15.25
Light copper	14.00-14.25
No. 1 composition	13.50
No. 1 comp turnings	13.00
Rolled brass	11.50
Brass pipe	12.50
Radiators	10.50-10.75
Heavy yellow brass	10.25-10.50
Aluminum	
Mixed old cast	9.25- 9.50
Mixed old clips	10.25-10.50
Mixed turnings, dry	9.50
Pots and pans	9.75
Low copper	11.00-11.50

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	14½—14¾
No. 2 heavy copper and wire	13½—13¾
Light copper	12½—12¾
Auto radiators (unsweated)	9 — 9¼
No. 1 composition	12 —12¼
No. 1 composition turnings	11½—11¾
Clean red car boxes	9⅜—10
Cocks and faucets	9¾—10
Mixed heavy yellow brass	8 — 8¼
Old rolled brass	9 — 9¼
Brass pipe	10¼—10½
New soft brass clippings	11¼—11¾
Brass rod ends	10¼—10½
No. 1 brass rod turnings	10 —10¼

Aluminum

Alum. pistons and struts	5 — 5½
Aluminum crankcases	7½— 8
2S aluminum clippings	10½—11
Old sheet and utensils	7½— 8
Borings and turnings	4½
Misc. cast aluminum	7½— 8
Dural clips (24S)	7½— 8

Zinc

New zinc clippings	7 — 7½
Old zinc	5 — 5½
Zinc routings	3½— 4
Old die cast scrap	4 — 4½

Nickel and Monel

Pure nickel clippings	21 —23
Clean nickel turnings	14 —15
Nickel anodes	20 —22
Nickel rod ends	20 —22
New Monel clippings	12 —14
Clean Monel turnings	8 — 9
Old sheet Monel	10 —12
Old Monel castings	9 —10
Inconel clippings	11 —13
Nickel silver clippings, mixed	8 —10
Nickel silver turnings, mixed	6 — 7

Lead

Soft scrap, lead	8¾— 9
Battery plates (dry)	4⅜— 4⅝

Magnesium

Segregated solids	9 —10
Castings	5½— 6½

Miscellaneous

Block tin	60 —62
No. 1 pewter	38 —40
No. 1 auto babbitt	35 —37
Mixed common babbitt	8¾— 9
Solder joints	11 —11½
Siphon tops	40 —42
Small foundry type	11½—12
Monotype	10½—11
Lino. and stereotype	9¾—10¼
Electrotype	8¾— 9
New type shell cuttings	12½—12¾
Hand picked type shells	5 — 5½
Lino. and stereo. dross	4¼— 4¾
Electro. dross	2¾— 3

MARKETS—PRICES—TRENDS

SCRAP
Iron & Steel

Steelmaking Grades Top Price Advance

New York—This week the market is tugging at its leash. It is making some progress, too. Price advances are general in nearly all areas and grades. Mills have come into the market for more tonnage, and this has put more steam into a market that was already strong.

Although cast grades showed the greatest strength last week, steelmaking grades are leading the parade of higher prices this week. Advances of $1.00 a ton at Pittsburgh and Chicago raised THE IRON AGE steel scrap composite price 66¢ a ton to $29.58 a gross ton. This is another new high for the year.

Anticipation of continued high steelmaking operations is probably the biggest factor in the market this week. It has brought the mills into the market for tonnage, and it has also caused greater speculation than we have experienced for some time.

PITTSBURGH—A realistic appraisal of the market establishes a top price of $34 for No. 1 heavy melting scrap. Brokers are paying $33 and $33.50 to fill old orders. A large consumer was frank to admit that anything below $34 is purely fictitious. He was offered only a limited tonnage at the $34 figure. Short turnings were up $2 to a top of $28 on a sale. Machine shop turnings were up 50¢, and low phos advanced a similar amount. Heavy turnings jumped $2; scrap rails, rails 2 ft and under, and No. 1 machinery cast were stronger.

CHICAGO—A purchase of No. 1 heavy melting steel brought the price up $1 over last week's top of $29. No. 2 heavy melting steel also advanced $1 over the previous week's quotation. There is a considerable amount of mill buying resistance to the increasing prices. Brokers don't want to sell at the low prices offered by the mills. It is expected that the mills will be in the market for scrap more heavily in the next 30 days and will be unable to resist price advances.

PHILADELPHIA—The undertone of the market continued strong last week. But there was no upward price movement. Scrap, particularly bundles, continues to move to western markets where higher prices are in effect. This movement was threatened on Monday by the Pennsylvania Railroad embargo on eastern shipments to destinations beyond Harrisburg. But deferral of the strike for two weeks ended the embargo. The cast market continued firm, and some pipe foundries are buying at higher prices. There were no changes in quoted prices.

NEW YORK—Prices are higher on almost all grades in the market here. A flurry of new orders late last week put more steam into the market which was already strong. When the smoke had cleared this week brokers were paying $23.50 to $24 for No. 1 heavy melting steel. Biggest advance was scored by No. 1 bundles (up $2), while other grades gained from 50¢ to $1.50 a ton.

DETROIT—All the evidence points to a very strong scrap market here with the final test coming when industrial lists are awarded at the end of the month. Reports of prices well over $30 for industrial bundles continued to be heard although dealers continue to report their bundles are still lagging in demand as well as price. Blast furnace grades are strong and cast iron continues to show unmistakable evidence of strength. Prices of electric furnace grades, blast furnace and cast grades are up this week and a continued upward spiral is freely predicted by the trade.

CLEVELAND—No. 1 grades, low phos and blast furnace, were up $1 in this district, following sales of representative tonnages to major consumers in the valley at press time. Despite the strength in these grades, No. 2 steel has not moved except on old orders. Foundry grades are strong and moving at quoted prices.

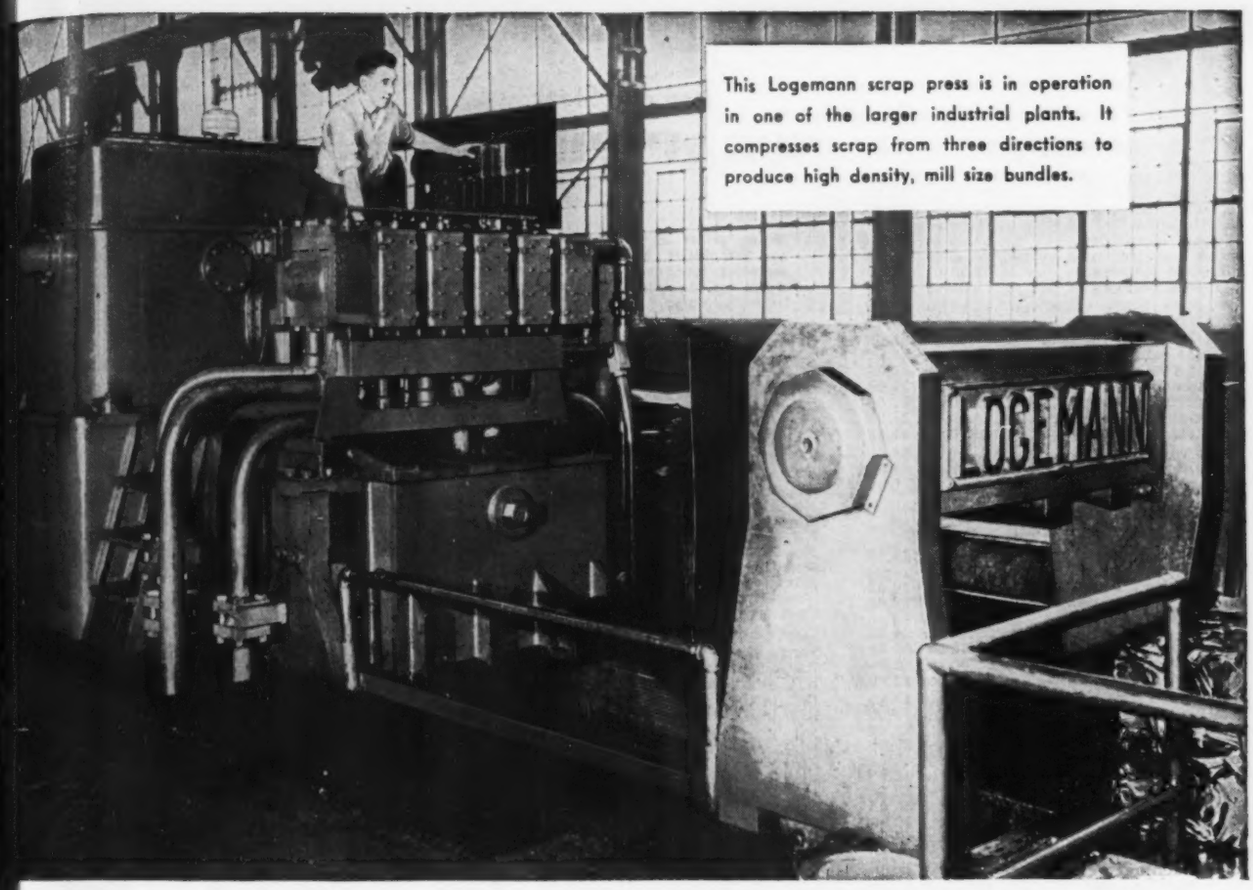
ST. LOUIS—A district steel mill came into the market for 30,000 tons of No. 1 heavy melting steel at an advance of $1 a ton, and this had the effect of increasing prices of other items. The orders were divided among five or six brokers and delivery is to be within 45 days. Short supply has brought strength to the market.

CINCINNATI—Heavy melting grades advanced to $31 on sales to district consumers in a strong scrap market here. Mills are moving in for their May requirements and the market is picking up sympathetic strength from other districts. Many dealers are holding out for more money, on the assumption that prices will be higher before they are lower. Anticipatory buying by some brokers is also adding to the melee. Foundry grades are moving. Two Cincinnati scrap prices listed in the Apr. 20 issue were typographical errors. They should have read No. 1 heavy melting and No. 1 bundles $29 to $29.50 and No. 2 heavy melting $22.50 to $23.

BOSTON—Further strength showed in this market last week with price advances ranging from 50¢ to $1.50. This was the eighth week in succession that prices have advanced, and the undertone of the market is strong. No. 1 melting went up 50¢ for a spread of $21.50 to $22.50. Turnings grades advanced 50¢ to $1.

TORONTO—Canadian steel mills have advanced their buying price for steel scrap $3 per gross ton, with the exception of steel turnings which have been marked up $2 per ton delivered Hamilton. Local dealers state that demand for steel scrap is being maintained at a high level and while there are no excessive stocks in the country neither is there an actual shortage at this time.

BIRMINGHAM—No. 1 and No. 2 heavy melting steel have advanced $2 here and the market is strong throughout the list. Demand is particularly strong for No. 1 busheling and it is bringing the same price as No. 1 heavy melting steel.



This Logemann scrap press is in operation in one of the larger industrial plants. It compresses scrap from three directions to produce high density, mill size bundles.

Self-Contained . . . .
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Both two-ram and three-ram models are available with automatic controls or for manual manipulation.

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Iron and Steel

SCRAP PRICES

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$33.50 to $34.00
No. 2 hvy. melting	29.50 to 30.00
No. 1 bundles	33.50 to 34.00
No. 2 bundles	27.00 to 27.50
Machine shop turn.	24.50 to 25.00
Mixed bor. and ms. turns.	24.50 to 25.00
Shoveling turnings	27.50 to 28.00
Cast iron borings	25.50 to 26.00
Low phos. plate	36.00 to 36.50
Heavy turnings	32.00 to 33.00
No. 1 RR. hvy. melting	34.50 to 35.00
Scrap rails, random lgth.	38.50 to 39.00
Rails 2 ft and under	40.00 to 41.00
RR. steel wheels	36.50 to 37.00
RR. spring steel	36.50 to 37.00
RR. couplers and knuckles	36.50 to 37.00
No. 1 machinery cast	40.00 to 41.00
Mixed yard cast.	35.50 to 36.00
Heavy breakable cast.	33.00 to 34.00
Malleable	35.00 to 36.00

Chicago

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 factory bundles	28.00 to 29.00
No. 1 dealers' bundles	27.00 to 28.00
No. 2 dealers' bundles	24.00 to 25.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	21.00 to 22.00
Low phos. forge crops	32.00 to 33.00
Low phos. plate	31.50 to 32.50
No. 1 RR. hvy. melting	31.00 to 32.00
Scrap rails, random lgth.	36.00 to 37.00
Rerolling rails	46.00 to 47.00
Rails 2 ft and under	42.50 to 43.00
Locomotive tires, cut	34.00 to 35.00
Cut bolsters & side frames	31.00 to 32.00
Angles and splice bars	37.00 to 38.00
RR. steel car axles	45.00 to 46.00
RR. couples and knuckles	32.00 to 33.00
No. 1 machinery cast	42.00 to 43.00
No. 1 agricul. cast.	38.00 to 39.00
Heavy breakable cast.	30.00 to 31.00
RR. grate bars	30.00 to 31.00
Cast iron brake shoes	31.00 to 32.00
Cast iron car wheels	36.00 to 37.00
Malleable	40.00 to 41.00

Philadelphia

No. 1 hvy. melting	$25.00 to $26.00
No. 2 hvy. melting	23.00 to 24.00
No. 1 bundles	25.00 to 26.00
No. 2 bundles	19.50 to 20.50
Machine shop turn.	17.50 to 18.00
Mixed bor. and turn.	16.50 to 17.00
Shoveling turnings	20.00 to 20.50
Low phos. punchings, plate	29.00 to 30.00
Low phos. 5 ft and under	28.00 to 29.00
Low phos. bundles	26.50 to 27.00
Hvy. axle forge turn.	25.00 to 26.00
Clean cast chem. borings	29.00 to 30.00
RR. steel wheels	31.00 to 32.00
RR. spring steel	31.00 to 32.00
Rails 18 in. and under	38.50 to 39.50
No. 1 machinery cast	37.00 to 38.00
Mixed yard cast	33.00 to 34.00
Heavy breakable cast	35.00 to 36.00
Cast iron carwheels	39.00 to 40.00
Malleable	39.00 to 40.00

Cleveland

No. 1 hvy. melting	$31.00 to $31.50
No. 2 hvy. melting	28.00 to 28.50
No. 1 busheling	31.00 to 31.50
No. 1 bundles	31.00 to 31.50
No. 2 bundles	24.50 to 25.00
Machine shop turn.	21.50 to 22.00
Mixed bor. and turn.	24.50 to 25.00
Shoveling turnings	24.50 to 25.00
Cast iron borings	24.50 to 25.00
Low phos. 2 ft and under	31.00 to 31.50
Steel axle turn.	29.00 to 29.50
Drop forge flashings	31.00 to 31.50
No. 1 RR. hvy. melting	34.00 to 34.50
Rails 3 ft and under	43.00 to 43.50
Rails 18 in. and under	44.00 to 45.00
No. 1 machinery cast.	44.00 to 44.50
RR. cast	44.00 to 44.50
RR. grate bars	32.00 to 33.00
Stove plate	36.00 to 37.00
Malleable	40.00 to 41.00

Youngstown

No. 1 hvy. melting	$34.50 to $35.00
No. 2 hvy. melting	31.50 to 32.00
No. 1 bundles	34.50 to 35.00
No. 2 bundles	$28.50 to $29.00
Machine shop turn.	24.00 to 24.50
Shoveling turnings	26.00 to 26.50
Cast iron borings	26.00 to 26.50
Low phos. plate	35.50 to 36.00

Buffalo

No. 1 hvy. melting	$29.50 to $30.00
No. 2 hvy. melting	27.50 to 28.00
No. 1 busheling	27.50 to 28.00
No. 1 bundles	28.50 to 29.00
No. 2 bundles	26.00 to 26.50
Machine shop turn.	18.00 to 18.50
Mixed bor. and turn.	19.00 to 19.50
Shoveling turnings	20.50 to 21.00
Cast iron borings	19.50 to 20.00
Low phos. plate	31.00 to 31.50
Scrap rails, random lgth.	33.50 to 34.00
Rails 2 ft and under	38.50 to 39.00
RR. steel wheels	33.00 to 33.50
RR. spring steel	33.00 to 33.50
RR. couplers and knuckles	33.00 to 33.50
No. 1 machinery cast.	37.50 to 38.00
No. 1 cupola cast.	33.00 to 34.00
Stove plate	32.00 to 32.50
Small indus. malleable	30.00 to 30.50

Birmingham

No. 1 hvy. melting	$26.00
No. 2 hvy. melting	24.00
No. 2 bundles	22.00
No. 1 busheling	26.00
Machine shop turn.	$18.00 to $18.50
Shoveling turnings	20.00 to 21.00
Cast iron borings	19.00
Bar crops and plate	29.00
Structural and plate	29.00
No. 1 RR. hvy. melt.	28.00 to 28.50
Scrap rails, random lgth.	31.00 to 32.00
Rerolling rails	36.00 to 37.00
Rails 2 ft and under	36.00
Angles & splice bars	35.00 to 36.00
Std. steel axles	30.00 to 31.00
No. 1 cupola cast.	35.00 to 36.00
Stove plate	30.50 to 31.50
Cast iron carwheels	30.00 to 31.00

St. Louis

No. 1 hvy. melting	$30.50 to $31.50
No. 2 hvy. melting	27.00 to 28.00
No. 2 bundled sheets	26.00 to 27.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	19.00 to 20.00
Rails, random lengths	33.00 to 34.00
Rails 3 ft and under	38.00 to 40.00
Locomotive tires, uncut	31.00 to 32.00
Angles and splice bars	36.00 to 37.00
Std. steel car axles	43.00 to 44.00
RR. spring steel	32.00 to 33.00
No. 1 machinery cast.	38.00 to 39.00
Hvy. breakable cast.	31.00 to 32.00
Cast iron brake shoes	30.00 to 31.00
Stove plate	29.00 to 30.00
Cast iron car wheels	35.00 to 36.00
Malleable	33.00 to 34.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$23.50 to $24.00
No. 2 hvy. melting	20.00 to 21.00
No. 2 bundles	19.00 to 19.50
Machine shop turn.	14.00 to 14.50
Mixed bor. and turn.	14.00 to 14.50
Shoveling turnings	15.50 to 16.00
Clean cast chem. bor.	23.00 to 24.00
No. 1 machinery cast.	30.00 to 30.50
Mixed yard cast.	28.00 to 28.50
Charging box cast.	29.00 to 30.00
Heavy breakable cast.	29.00 to 30.00
Unstrp. motor blocks	21.00 to 21.50

Boston

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$21.50 to $22.50
No. 2 hvy. melting	19.00 to 19.50
No. 1 bundles	21.50 to 22.50
No. 2 bundles	$18.00 to $18.50
Machine shop turn.	14.00 to 14.50
Mixed bor. and turn.	13.50 to 14.00
Shoveling turnings	15.00 to 15.50
No. 1 busheling	21.00 to 21.50
Clean cast chem. borings	19.00 to 19.50
No. 1 machinery cast.	30.00 to 31.00
No. 2 machinery cast.	25.00 to 26.00
Heavy breakable cast.	26.00 to 27.00
Stove plate	24.00 to 25.00

Detroit

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$24.50 to $25.00
No. 2 hvy. melting	22.00 to 22.50
No. 1 bundles	30.00 to 30.50
New busheling	29.00 to 29.50
Flashings	24.50 to 25.00
Machine shop turn.	17.50 to 18.00
Mixed bor. and turn.	17.50 to 18.00
Shoveling turnings	21.00 to 21.50
Cast iron borings	21.00 to 21.50
Low phos. plate	29.00 to 29.50
No. 1 cupola cast.	37.00 to 38.00
Heavy breakable cast.	30.00 to 31.00
Stove plate	32.00 to 33.00
Automotive cast.	41.00 to 42.00

Cincinnati

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	$30.50 to $31.00
No. 2 hvy. melting	24.50 to 25.00
No. 1 bundles	30.50 to 31.00
No. 2 bundles	24.50 to 25.00
Machine shop turn.	15.50 to 16.00
Mixed bor. and turn.	17.50 to 18.00
Shoveling turnings	18.50 to 19.00
Cast iron borings	18.50 to 19.00
Low phos. 18 in. under	35.00 to 35.50
Rails, random lengths	36.50 to 37.50
Rails, 18 in. and under	44.00 to 45.00
No. 1 cupola cast	41.00 to 42.00
Hvy. breakable cast.	34.00 to 35.00
Drop broken cast	43.00 to 44.00

San Francisco

No. 1 hvy. melting	$20.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Machine shop turn.	9.00
Elec. fur. 1 ft and under	28.00
No. 1 RR. hvy. melting	20.00
Scrap rails, random lgth.	20.00
No. 1 cupola cast.	$30.00 to 33.50

Los Angeles

No. 1 hvy. melting	$20.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Mach. shop turn.	5.00
Elec. fur. 1 ft and under	30.00
No. 1 RR. hvy. melting	20.00
No. 1 cupola cast.	$32.50 to 35.00

Seattle

No. 1 hvy. melting	$18.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	12.00
Elec. fur. 1 ft and under	$29.00 to 30.00
RR. hvy. melting	19.00
No. 1 cupola cast.	30.00 to 35.00
Heavy breakable cast.	20.00

Hamilton, Ont.

No. 1 hvy. melting	$27.00
No. 1 bundles	19.00
No. 2 bundles	19.00
Mechanical bundles	25.00
Mixed steel scrap	23.00
Mixed bor. and turn.	20.00
Rails, remelting	27.00
Rails, rerolling	30.00
Bushelings	21.50
Bush., new fact, prep'd.	25.00
Bush., new fact, unprep'd.	20.00
Short steel turnings	20.00
Cast scrap	40.00

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	Apr. 25, 1950	Apr. 18, 1950	Mar. 28, 1950	Apr. 26, 1949
Hot-rolled sheets	3.35	3.35	3.35	3.25
Cold-rolled sheets	4.10	4.10	4.10	4.00
Galvanized sheets (10 ga)	4.40	4.40	4.40	4.40
Hot-rolled strip	3.25	3.25	3.25	3.25
Cold-rolled strip	4.21	4.21	4.21	4.038
Plates	3.50	3.50	3.50	3.42
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	33.00	33.00	33.00	33.00
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes	$7.50	$7.50	$7.50	$7.75
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.70
Special coated mfg. ternes	6.50	6.50	6.50	6.65
Bars and Shapes: (cents per pound)				
Merchant bars	3.45	3.45	3.45	3.35
Cold-finished bars	4.145	4.145	4.145	3.995
Alloy bars	3.95	3.95	3.95	3.75
Structural shapes	3.40	3.40	3.40	3.25
Stainless bars (No. 302)	28.50	28.50	28.50	28.50
Wrought iron bars	9.50	9.50	9.50	9.50
Wire: (cents per pound)				
Bright wire	4.50	4.50	4.50	4.15
Rails: dollars per 100 lb)				
Heavy rails	$3.40	$3.40	$3.40	$3.20
Light rails	3.75	3.75	3.75	3.55
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$54.00	$54.00	$54.00	$52.00
Slabs, rerolling	54.00	54.00	54.00	52.00
Forging billets	63.00	63.00	63.00	61.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	63.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	3.85	3.85	3.85	3.40
Skelp	3.15	3.15	3.15	3.25

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron: (per gross ton)	Apr. 25, 1950	Apr. 18, 1950	Mar. 28, 1950	Apr. 26, 1949
No. 2, foundry, Phila.	$50.42	$50.42	$50.42	$50.65
No. 2, Valley furnace	46.50	46.50	46.50	46.50
No. 2, Southern Cin'ti	49.08	49.08	49.08	49.47
No. 2, Birmingham	42.38	42.38	42.38	43.38
No. 2, foundry, Chicago†	46.50	46.50	46.50	46.50
Basic del'd Philadelphia	49.92	49.92	49.92	49.81
Basic, Valley furnace	46.00	46.00	46.00	46.00
Malleable, Chicago†	46.50	46.50	46.50	46.50
Malleable, Valley	46.50	46.50	46.50	46.50
Charcoal, Chicago	68.56	68.56	68.56	73.78
Ferromanganese‡	173.40	173.40	173.40	173.40

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$33.75	$32.75	$32.25	$23.75
Heavy melt'g steel, Phila.	25.50	25.50	24.50	22.00
Heavy melt'g steel, Ch'go	29.50	28.50	28.50	23.00
No. 1 hy. com. sh't, Det.	30.25	29.25	26.75	16.75
Low phos. Young'n	35.75	34.75	33.75	24.75
No. 1, cast, Pittsburgh	40.50	39.50	39.50	29.50
No. 1, cast, Philadelphia	37.50	37.50	36.50	28.00
No. 1, cast, Chicago	42.50	41.50	40.50	27.00
Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.25	$14.25	$14.25	$14.50
Foundry coke, prompt	16.25	16.25	16.25	16.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	19.50	19.50*	18.50	21.50
Copper, Lake Conn.	19.625	19.625*	18.625	23.625
Tin Straits, New York	76.75†	76.75*	76.50	$1.03
Zinc, East St. Louis	11.00	10.50	10.25	13.00
Lead, St. Louis	10.55	10.30	10.30	14.80
Aluminum, virgin	17.00	17.00	17.00	17.00
Nickel electrolytic	42.97	42.97	42.97	42.93
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	24.50	24.50	24.50	38.50

* Revised. † Tentative.

Composite Prices

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

	Finished Steel Base Price	Pig Iron	Scrap Steel
Apr. 25, 1950	3.837¢ per lb.	$46.38 per gross ton	$29.58 per gross ton
One week ago	3.837¢ per lb.	46.38 per gross ton	28.92 per gross ton
One month ago	3.837¢ per lb.	46.38 per gross ton	28.58 per gross ton
One year ago	3.749¢ per lb.	46.57 per gross ton	22.92 per gross ton

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Scrap Steel High	Scrap Steel Low
1950	3.837¢ Jan. 3	3.837¢ Jan. 3	$46.38 Feb. 7	$45.88 Jan. 3	$29.58 Apr. 25	$26.25 Jan. 3
1949	3.837¢ Dec. 27	3.3705¢ May 3	46.87 Jan. 18	45.88 Sept. 6	43.00 Jan. 4	19.33 June 28
1948	3.721¢ July 27	3.193¢ Jan. 1	46.91 Oct. 12	39.58 Jan. 6	43.16 July 27	39.75 Mar. 9
1947	3.193¢ July 29	2.848¢ Jan. 1	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
1946	2.848¢ Dec. 31	2.464¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.464¢ May 29	2.396c Jan. 1	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.396¢	2.396¢	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.396¢	2.396¢	23.61	23.61	$19.17	$19.17
1942	2.396¢	2.396¢	23.61	23.61	19.17	19.17
1941	2.396¢	2.396¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1932	1.89196¢ July 5	1.83910¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Based on averages for basic iron at Valley furnaces and foundry iron as Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

IRON AGE

STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	$50.00 1													$50.00 31
Alloy, net ton	$51.00 1.17													$51.00 31
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	$53.00 1	$53.00 1	$53.00 1				$57.00 13		$53.00 3	$58.00 26	$53.00 3			
Carbon forging billets, net ton	$63.00 1	$63.00 1.4	$63.00 1.8	$63.00 4			$63.00 25		$63.00 3.4	$65.00 26	$63.00 3			$63.00 31
Alloy, net ton	$66.00 1.17	$66.00 1.4	$66.00 1		$66.00 4.42		$66.00 13	$66.00 3	$66.00 3.4	$68.00 26	$66.00 3			$66.00 31
SHEET BARS							$57.00 13							
PIPE SKELP	3.15 1						3.15 1.4							
WIRE RODS	3.85 2.18	3.85 2.4.33	3.85 6	3.85 2			3.85 6				3.85 3	3.95 3		
SHEETS Hot-rolled (18 ga. & hvr.)	3.35 1.5.9.15	3.35 23	3.35 1.6.8	3.35 4.5			3.35 1.4.6.13		3.35 3	3.45 26		3.35 3		3.55 12
Cold-rolled	4.10[1.5] 7.9.15.63		4.10 1.6.8	4.10 4.15		4.10 7	4.10 4.6		4.10 3			4.10 3	4.30 22	4.30 12
Galvanized (10 gage)	4.40 1.9.15		4.40 1.8		4.40 4		4.65[34] 4.75[44]					4.40 3		
Enameling (12 gage)	4.40 1		4.40 1.8	4.40 4		4.40 7	4.40[6] 4.90[76]						4.60 22	4.70 12
Long ternes (10 gage)	4.80 9.15		4.80 1			4.80 7	4.80 64							
Hi Str. low alloy, h.r.	5.05 1.5.9	5.05 1	5.05 1.6.8	5.05 4.5			5.05 1.4.6.13		5.05 3	5.05 26		5.05 3		5.25 12
Hi str. low alloy, c.r.	6.20 1.5.9		6.20 1.6.8	6.20 4.5			6.20 4.6.13		6.20 3			6.20 3		6.40 12
Hi str. low alloy, galv.	6.75 1											6.75 3		
STRIP Hot-rolled	3.25 5.7.9.28	3.25 3.66	3.25 1.6.8	3.25 5			3.25 1.4.6.13		3.25 3	3.35 26		3.25 3		3.45 12.47
Cold-rolled	4.15 5.7.9.63	4.30 8.68	4.30 8	4.15 2.5		4.15 7	4.15 4.6.13.40.48.49		4.15 3			4.15 3		4.40[68.81] 4.35[12.47]
Hi str. low alloy, h.r.	4.95 9		4.95 1.6.8	4.95 5			4.95 1.4.6.13		4.95 3	4.95 26		4.95 3		5.15 12
Hi Str. low alloy, c.r.	6.20 9			6.20 2.5			6.20 4.6.13		6.20 3			6.20 3		6.40 12
TINPLATE† Cokes, 1.50-lb base box 1.25 lb, deduct 20¢	$7.50 1.5.9.15		$7.50 1.6.8				$7.50 4					$7.60 3	$7.70 22	
Electrolytic 0.25, 0.50, 0.75 lb box	Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price													
BLACKPLATE, 29 gage Hollowware enameling	5.30 1.5.15		5.30 1.6				5.30 4					5.40 3	5.50 22	
BARS Carbon steel	3.45 1.5.9.17	3.45 1.4.23	3.45 1.6.8	3.45 4	3.45 4		3.45 1.4.6		3.45 3.4		3.45 3			3.65 12
Reinforcing‡	3.45 1.5	3.45 4	3.45 1.6.8	3.45 4			3.45 1.4.6		3.45 3.4		3.45 3	3.45 3		
Cold-finished	4.10[5] 4.15[2.4] 17.52.69.71	4.15[2] 23.69.70	4.15 4.73.74	4.15 2.61	4.15 4.22.52		4.15 6.40.57		4.15 70					4.35[12] 4.30[24]
Alloy, hot-rolled	3.95 1.17	3.95 1.4.23	3.95 1.6.8		3.95 4		3.95 1.6.25	3.95 3	3.95 3.4		3.95 3			4.25 12
Alloy, cold-drawn	4.90 2.17.52.69.71	4.90 2.23.69.70	4.90 4.73.74	4.90 2.61	4.90 4.42.52		4.90 6.25.57	4.90 3	4.90 3.70					5.05[24]
Hi str. low alloy, h.r.	5.20 1.5		5.20 1.6.8	5.20 4			5.20 1.6	5.20 3	5.20 3		5.20 3			5.40 12
PLATE Carbon steel	3.50 1.5	3.50 1	3.50 1.6.8	3.50 4			3.50 1.13		3.50 3	3.60 26	3.50 3	3.50 3		3.75 12
Floor Plates	4.55 1	4.55 1	4.55 3	4.55 5						4.55 26				
Alloy	4.40 1	4.40 1	4.40 1				4.40 13			4.40 26	4.40 3	4.40 3		
Hi Str. low alloy	5.35 1.5	5.35 1	5.35 1.3	5.35 4.5			5.35 6			5.35 26	5.35 3	5.35 3		5.60 12
SHAPES, Structural	3.40 1.5.9	3.40 1.23	3.40 1.6.8					3.45 3	3.45 3		3.45 3			
Hi Str. low alloy	5.15 1.5	5.15 1	5.15 1.6.8				5.15 6	5.15 3	5.15 3		5.15 3			
MANUFACTURER'S WIRE Bright	4.50 2.5.18	4.50[2] 4.12.33.34		4.50 2.77			4.50 6	Kokomo=4.60[30]			4.50 3	4.60 3	Duluth=4.50[2] Pueblo=4.75[14]	
PILING, Steel Sheet	4.20[1.9]	4.20 1							4.20 3					

STEEL PRICES

Smaller numbers indicate producing companies. See key at right.
Prices are in cents per lb unless otherwise noted. Extras apply.

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
					INGOTS Carbon forging net ton
	$59.00 83				Alloy, net ton
		$53.00 11	F=$72.00[19]		BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	$71.00 83	$63.00 11	F=$82.00[19]	Geneva=$61.00[16]	Carbon forging billets, net ton
	$74.00 83		F=$85.00[19]		Alloy net ton
				Portsmouth=$55.00[20]	SHEET BARS
					PIPE SKELP
	4.25 83	3.85 11	SF=4.50[24] LA=4.65[24,62]	Portsmouth=3.85[20] Worcester=4.15[2]	WIRE RODS
		3.35 4,11	SF, LA=4.05[24] F=4.25[19]	Ashland[7]=3.35 Niles=3.50[44]	SHEETS Hot-rolled (18 ga. & hvr.)
		4.10 11	SF=5.05[24] F=5.00[19]		Cold-rolled
		4.40 4,11	SF, LA=5.15[24]	Ashland=4.40[7] Kokomo=4.50[30]	Galvanized (10 gage)
					Enameling (12 gage)
					Long ternes (10 gage)
		5.05 11	F=6.74[19]		Hi Str. low alloy, h.r.
			F=7.05[19]		Hi Str. low alloy, c.r.
					Hi Str. low alloy, galv.
3.85 83	3.65 83	3.25 11	SF, LA=4.00[24,62] F=4.40[19], S=4.25[62]	Ashland=3.25[7] Atlanta=3.40[65]	STRIP Hot-rolled
			F=5.40[19] LA=5.50[27]	New Haven=4.65[2,68]	Cold-rolled
		4.95 11	F=6.64[19]		Hi Str. low alloy, h.r.
			F=6.95[19]		Hi Str. low alloy, c.r.
		7.60 11	SF=8.25[24]		TINPLATE Cokes, 1.50-lb base box 1.25 lb, deduct 20¢
Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Hollowware enameling
4.05 83	3.85 83	3.45 4,11	SF, LA=4.15[24] LA=4.15[62]	Atlanta=3.60[65]	BARS Carbon steel
4.05 83	3.85 83	3.45 4,11	SF, S=4.20[62] F=4.10[19]	Atlanta=3.60[65]	Reinforcing‡
				Putnam, Newark=4.55[69]	Cold-finished
4.55 83	4.35 83		LA=5.00[62] F=4.95[19]		Alloy, hot-rolled
				Newark,[69] Worcester[2]=5.20 Hartford=5.20[4]	Alloy, cold-drawn
		5.20	F=6.25[19]		Hi Str. low alloy, h.r.
	3.90 83	3.50 4,11	F=4.10[19] S=4.40[62] Geneva=3.50[16]	Claymont=3.60[29] Coatesville=3.60[21] Harrisburg=3.50[35]	PLATE Carbon steel
				Harrisburg=4.55[35]	Floor plates,
			F=5.40[19]	Coatesville=4.50[21]	Alloy
		5.35 11	F=5.95[19]	Geneva=5.35[16]	Hi Str. low alloy
4.00 83	3.80 83	3.40 11	SF=3.95[62] LA=4.00[24,62]	Phoenixville=3.30[56] Geneva=3.40[16]	SHAPES, Structural
		5.15 11	F=4.00[19] S=4.05[62]	Fontana=5.75[19] Geneva=5.15[16]	Hi Str. low alloy
5.10 83	4.90 83	4.50 4,11	SF, LA=5.45[24,62]	Portsmouth=4.50[29] Worcester=4.80[2]	MANUFACTURER'S WIRE Bright

Notes: †Special coated mfg ternes deduct $1.00 from 1.50-lb coke base box price. Can-making quality blackplate, 55 to 128-lb, deduct $1.90 from 1.50-lb coke base box. ‡Straight lengths only from producer to fabricator.

KEY TO STEEL PRODUCERS

With Principal Offices

1 Carnegie-Illinois Steel Corp., Pittsburgh
2 American Steel & Wire Co., Cleveland
3 Bethlehem Steel Co., Bethlehem
4 Republic Steel Corp., Cleveland
5 Jones & Laughlin Steel Corp., Pittsburgh
6 Youngstown Sheet & Tube Co., Youngstown
7 Armco Steel Corp., Middletown, Ohio
8 Inland Steel Co., Chicago
9 Weirton Steel Co., Weirton, W. Va.
10 National Tube Co., Pittsburgh
11 Tennessee Coal, Iron & R. R. Co., Birmingham
12 Great Lakes Steel Corp., Detroit
13 Sharon Steel Corp., Sharon, Pa.
14 Colorado Fuel & Iron Corp., Denver
15 Wheeling Steel Corp., Wheeling, W. Va.
16 Geneva Steel Co., Salt Lake City
17 Crucible Steel Co. of America, New York
18 Pittsburgh Steel Co., Pittsburgh
19 Kaiser Co., Inc., Oakland, Calif.
20 Portsmouth Steel Corp., Portsmouth, Ohio
21 Lukens Steel Co., Coatesville, Pa.
22 Granite City Steel Co., Granite City, Ill.
23 Wisconsin Steel Co., South Chicago, Ill.
24 Columbia Steel Co., San Francisco
25 Copperweld Steel Co., Glassport, Pa.
26 Alan Wood Steel Co., Conshohocken, Pa.
27 Calif. Cold Rolled Steel Corp., Los Angeles
28 Allegheny Ludlum Steel Corp., Pittsburgh
29 Worth Steel Co., Claymont, Del.
30 Continental Steel Corp., Kokomo, Ind.
31 Rotary Electric Steel Co., Detroit
32 Laclede Steel Co., St. Louis
33 Northwestern Steel & Wire Co., Sterling, Ill.
34 Keystone Steel & Wire Co., Peoria, Ill.
35 Central Iron & Steel Co., Harrisburg, Pa.
36 Carpenter Steel Co., Reading, Pa.
37 Eastern Stainless Steel Corp., Baltimore
38 Washington Steel Corp., Washington, Pa.
39 Jessop Steel Co., Washington, Pa.
40 Blair Strip Steel Co., New Castle, Pa.
41 Superior Steel Corp., Carnegie, Pa.
42 Timken Steel & Tube Div., Canton, Ohio
43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
44 Reeves Steel & Mfg. Co., Dover, Ohio
45 John A. Roebling's Sons Co., Trenton, N. J.
46 Simonds Saw & Steel Co., Fitchburg, Mass.
47 McLouth Steel Corp., Detroit
48 Cold Metal Products Co., Youngstown
49 Thomas Steel Co., Warren, Ohio
50 Wilson Steel & Wire Co., Chicago
51 Sweet's Steel Co., Williamsport, Pa.
52 Superior Drawn Steel Co., Monaca, Pa.
53 Tremont Nail Co., Wareham, Mass.
54 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
55 Ingersoll Steel Div., Chicago
56 Phoenix Iron & Steel Co., Phoenixville, Pa.
57 Fitzsimmons Steel Co., Youngstown
58 Stanley Works, New Britain, Conn.
59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
60 American Cladmetals Co., Carnegie, Pa.
61 Cuyahoga Steel & Wire Co., Cleveland
62 Bethlehem Pacific Coast Steel Corp., San Francisco
63 Follansbee Steel Corp., Pittsburgh
64 Niles Rolling Mill Co., Niles, Ohio
65 Atlantic Steel Co., Atlanta
66 Acme Steel Co., Chicago
67 Joslyn Mfg. & Supply Co., Chicago
68 Detroit Steel Corp., Detroit
69 Wyckoff Steel Co., Pittsburgh
70 Bliss & Laughlin, Inc., Harvey, Ill.
71 Columbia Steel & Shafting Co., Pittsburgh
72 Cumberland Steel Co., Cumberland, Md.
73 La Salle Steel Co., Chicago
74 Monarch Steel Co., Inc., Hammond, Ind.
75 Empire Steel Co., Mansfield, Ohio
76 Mahoning Valley Steel Co., Niles, Ohio
77 Oliver Iron & Steel Co., Pittsburgh
78 Pittsburgh Screw & Bolt Co., Pittsburgh
79 Standard Forging Corp., Chicago
80 Driver Harris Co., Harrison, N. J.
81 Detroit Tube & Steel Div., Detroit
82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
83 Sheffield Steel Corp., Kansas City
84 Plymouth Steel Co., Detroit

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column	Pittsburg, Calif.
Standard & coated nails*	106	125§
Woven wire fence†	116	139
Fence posts, carloads††	116	...
Single loop bale ties	113	137
Galvanized barbed wire**	126	146
Twisted barbless wire	126	146

* Pgh., Chi., Duluth; Worcester, 6 columns higher; Houston, 8 columns higher; Kansas City, 12 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. †† Duluth, Joliet; Johnstown, 112.

	Base per 100 lb	Pittsburg, Calif.
Merch. wire, annealed‡	$5.35	$6.30
Merch. wire, galv.‡	5.60	6.55
Cut nails, carloads‡‡	6.75	...

‡ Add 30¢ at Worcester; 20¢ at Chicago; 10¢ at Sparrows Pt.
‡‡ Less 20¢ to jobbers.
§ Torrance, 126.

PRODUCING POINTS — *Standard, Coated or galvanized nails, woven wire fence, bale ties, and barbed wire:* Alabama City, Ala., 4; Atlanta, 65; Aliquippa, Pa. (except bale ties), 5; Bartonville, Ill. (except bale ties), 34; Chicago, 4; Donora, Pa., 2; Duluth, 2; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 2; Kokomo, Ind., 30; Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 18; Pittsburg, Calif., 24; Portsmouth, Ohio, 20; Rankin, Pa. (except bale ties), 2; Sparrows Point (except woven fence), 3; Sterling, Ill., 33; San Francisco (except nails and woven fence), 14; Torrance, Calif. (nails only), 24; Worcester (nails only), 2; Houston (except bale ties), 83; Kansas City, 83.
Fence posts: Duluth, 2; Johnstown, Pa., 3; Joliet, Ill., 2; Minnequa, Colo., 14; Moline, Ill., 4; Williamsport, Pa., 51.
Cut nails: Wheeling, W. Va., 15; Conshohocken, Pa., 26; Warehame, Mass., 53.

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

Stainless-carbon	Plate	Sheet
No. 304, 20 pct,		
Coatesville, Pa. (21)	*26.50	
Washgtn, Pa. (39)	*26.50	
Claymont, Del. (29)	*26.50	
Conshohocken, Pa. (26)		*22.50
New Castle, Ind. (55)	*26.50	*24.00
Nickel-carbon		
10 pct, Coatesville (26)	27.50	
Inconel-carbon		
10 pct, Coatesville (21)	36.00	
Monel-carbon		
10 pct, Coatesville (21)	29.00	
No. 302 Stainless-copper-stainless, Carnegie, Pa. (60)		75.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)		7.75

* Includes annealing and pickling, or sandblasting.

ELECTRICAL SHEETS

22 gage, HR cut lengths, f.o.b. mill

	Cents per lb.
Armature	6.20
Electrical	6.70
Motor	*7.95
Dynamo	8.75
Transformer 72	9.30
Transformer 65	9.85
Transformer 58	10.55
Transformer 52	11.35

PRODUCING POINTS—Beech Bottom, W. Va., 18; Brackenridge, Pa., 28; Follansbee, W. Va., 63; Granite City, Ill., 22*; add 0.20¢; Indiana Harbor, Ind., 8; Mansfield, Ohio, 75; Niles, Ohio, 64, 76; Vandergrift, Pa., 1; Warren, Ohio, 4; Zanesville, Ohio, 7.

Numbers after producing points correspond to steel producers. See key on Steel Price page.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts, f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)
Base discount

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	27	38
9/16 & ⅝ in. x 6 in. & shorter	29	40
¾ in. & larger x 6 in. shorter	26	37
All diam, longer than 6 in.	22	34
Lag, all diam over 6 in. & longer	28	39
Lag, all diam x 6 in. & shorter	30	41
Plow bolts	40	—

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

	Pct Off List Reg	Hvy	Lt
½ in. and smaller	41	35	41
9/16 to ⅝ in.	36	30	36
¾ to 1½ in. inclusive	31	27	33
1⅝ in. and larger	21	17	..

In full case lots, 15 pct additional discount.

Stove Bolts

	Pct Off List
Packaged, steel, plain finish	63
Packaged, plated finish	50
Bulk, plain finish**	69*

* Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.
** Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Large Rivets

(½ in. and larger)
Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa. $7.25

Small Rivets

(7/16 in. and smaller)
Pct Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham 43

Cap and Set Screws

(In bulk)	Pct Off List
Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	60
¼ in. through ⅝ in. x 6 in. and shorter high C heat treated	54
Milled studs	23
Flat head cap screws, listed sizes	24
Fillister head cap, listed sizes	43
Set screws, sq head, cup point, 1 in. diam and smaller x 6 in. and shorter	59

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.15¢
0.41 to 0.60 carbon	5.95¢
0.61 to 0.80 carbon	6.55¢
0.81 to 1.05 carbon	8.50¢
1.06 to 1.35 carbon	10.80¢

Worcester, add 0.30¢.

LAKE SUPERIOR ORES

(51.50% *Fe; natural content, delivered lower lake ports*)

	Per gross ton
Old range, bessemer	$8.10
Old range, nonbessemer	7.95
Mesabi, bessemer	7.85
Mesabi, nonbessemer	7.70
High phosphorus	7.70

After Jan. 25, 1950, increases or decreases in Upper Lake rail freight, dock handling charges and taxes are for buyers' account.

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb	$3.40
Joint bars, per 100 lb	4.40
Light rails, per 100 lb	3.75

	Base Price cents per lb
Track spikes†	5.60
Axles	5.25
Screw spikes	8.60
Tie plates	4.20
Pittsburg, Torr., Calif.; Seattle	4.35
Track bolts, untreated**	8.85
Track bolts, heat treated, to railroads**	9.10

** Minnequa, deduct 25¢.
† Kansas City, 5.85¢.

PRODUCING POINTS—*Standard rails:* Bessemer, Pa., 1; Ensley, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Minnequa, Colo., 14; Steelton, Pa., 3.
Light rails: All the above except Indiana Harbor and Steelton, plus Fairfield, Ala., 11; Johnstown, Pa., 3; Minnequa, Colo., 14.
Joint bars: Bessemer, Pa., 1; Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Joliet, Ill., 1; Lackawanna, N. Y., 3; Steelton, Pa., 3; Minnequa, Colo., 14.
Track spikes: Fairfield, Ala., 11; Indiana Harbor, Ind., 6, 8; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 5; Chicago, 4; Struthers, Ohio, 6; Youngstown, 4.
Track bolts: Fairfield, Ala., 11; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 77, 78.
Axles: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 79; Johnstown, Pa., 3; McKees Rocks, Pa., 1.
Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Pittsburg, Calif., 24; Pittsburgh, 4; Seattle, 62; Steelton, Pa., 3; Torrance, Calif., 24; Minnequa, Colo., 14.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.00
18	4	1	—	5	$1.565
18	4	2	—	—	$1.13
1.5	4	1.5	8	—	71.5¢
6	4	2	6	—	76.5¢

High-carbon-chromium	57.5¢
Oil hardened manganese	32¢
Special carbon	29.5¢
Extra carbon	24.5¢
Regular carbon	21¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.00 to $14.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$16.00 to $16.50
Foundry, oven coke	
Buffalo, del'd	$24.00
Chicago, f.o.b.	21.00
Detroit, f.o.b.	20.40
New England, del'd	23.40
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	21.25
Swedeland, Pa., f.o.b.	21.20
Painesville, Ohio, f.o.b.	21.90
Erie, del'd	$21.04 to 21.25
Cleveland, del'd	22.62
Cincinnati, del'd	22.71
St. Paul, f.o.b.	23.50
St. Louis, del'd	21.60
Birmingham, del'd	20.20

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill. Base price, per ton net; Effective CaF, content:

70% or more	$37.00
60% or less	34.00

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	12.75	13.50	15.00	14.50	22.75	18.25	20.00	11.25	13.75	11.50
Slabs, billets, rerolling	17.00	18.25	20.25	19.25	30.25	24.50	26.75	15.50	18.50	15.25
Forg. discs, die blocks, rings	30.50	30.50	33.00	32.00	49.00	36.50	41.00	24.50	25.00	25.00
Billets, forging	24.25	24.25	26.25	25.50	39.00	29.00	32.75	19.50	20.00	20.00
Bars, wire, structurals	28.50	28.50	31.00	30.00	46.00	34.00	38.50	23.00	23.50	23.50
Plates	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	26.50-27.00	26.50
Sheets	37.50	37.50	39.50	39.50	53.00	45.50	50.00	33.00	33.50	35.50
Strip, hot-rolled	24.25	25.75	30.00	27.75	46.00	34.50	38.75	21.25	28.00	21.75
Strip, cold-rolled	30.50	33.00	36.50	35.00	55.00	44.50	48.50	27.00	33.50	27.50

Numbers correspond to producers. See Key on Steel Price Page.

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38, 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Ft. Wayne, Ind., 67; Lockport, N. Y., 46.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, 13; Butler, Pa., 7.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Ft. Wayne, Ind., 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.

Plates: Brackenridge, Pa., 28; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

REFRACTORIES (*F.o.b. works*)

Fire Clay Brick — *Carloads, Per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5) $86.00
No. 1 Ohio 80.00
Sec. quality, Pa., Md., Ky., Mo., Ill. 80.00
No. 2 Ohio 72.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50) 14.00

Silica Brick

Mt. Union, Pa., Ensley, Ala. $86.00
Childs, Pa. 90.00
Hays, Pa. 91.00
Chicago District 95.00
Western Utah and Calif. 101.00
Super Duty, Hays, Pa., Athens, Tex., Chicago 106.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 15.00
Silica cement, net ton, bulk, Hays, Pa. 17.00
Silica cement, net ton, bulk, Ensley, Ala. 16.00
Silica cement, net ton, bulk, Chicago District 16.00
Silica cement, net ton, bulk, Utah and Calif. 22.50

Chrome Brick — *Per Net Ton*

Standard chemically bonded, Balt., Chester $69.00

Magnesite Brick

Standard, Baltimore $91.00
Chemically bonded, Baltimore 80.00

Grain Magnesite

St. ⅜-in. grains

Domestic, f.o.b. Baltimore, in bulk fines removed ... $56.00 to $57.00
Domestic, f.o.b. Chewelah, Wash., in bulk 33.00
in sacks 38.00

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ ... $12.25

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.l.f. New York, ocean bags .... 7.4¢ to 9.0¢
Canadian sponge iron, del'd, in East ..... 10.00¢
Domestic sponge iron, 98+% Fe, carload lots ..... 9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe ..... 31.5¢ to 39.5¢
Electrolytic iron unannealed, minus 325 mesh, 99+% Fe ..... 48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe .. 63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe 70.0¢ to $1.35
Aluminum ..... 31.50¢
Brass, 10 ton lots ..... 23.50¢ to 27.25¢
Copper, electrolytic ..... 27.75¢
Copper, reduced ..... 27.00¢
Cadmium, 100-199 lb $2.95
Chromium, electrolytic, 99% min., and quantity $3.50
Lead ..... 17.00¢
Manganese ..... 52.00¢
Molybdenum, 99% $2.65
Nickel, unannealed ..... 56.00¢ to 66.00¢
Nickel, annealed ..... 72.00¢
Nickel, spherical, unannealed 69.00¢
Silicon ..... 34.00¢
Solder powder ..... 8.5¢ plus metal values
Stainless steel, 302 ..... 75.00¢
Tin ..... 85.75¢
Tungsten, 99% $2.90
Zinc, 10 ton lots ..... 15.75¢ to 18.50¢

ELECTRODES

Cents per lb., f.o.b. plant, threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb
	GRAPHITE	
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
	CARBON	
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
20	84, 90	7.50¢
17	60, 72	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

PIPE AND TUBING

Base discounts, f.o.b. mills
Base price, about $200.00 per net ton

Standard, T & C

Steel, Buttweld*	Black	Galv
½-in.	40½ to 38½	24 to 22
¾-in.	43½ to 41½	28 to 26
1-in.	46 to 44	31 to 29
1¼-in.	46½ to 44½	31½ to 29½
1½-in.	47 to 45	32 to 30
2-in.	47½ to 45½	32½ to 30½
2½ to 3-in.	48 to 46	33 to 31
Steel, lapweld		
2-in.	38	22½
2½ to 3-in.	42	26½
3½ to 6-in.	43 to 40	27½ to 24½
Steel, seamless		
2-in.	36	20½
2½ to 3-in.	39	23½
3½ to 6-in.	41	25½
Wrought Iron, buttweld		
½-in.	+26½	+53
¾-in.	+16½	+42
1 & 1¼-in.	+10½	+33
1½-in.	+ 4½	+29½
2-in.	+ 4	+29
Wrought Iron, lapweld		
2-in.	+13½	+37
2½ to 3½-in.	+11	+32½
4-in.	+ 6	+26½
4½ to 8-in.	+ 8	+28
8 to 12-in.	+18	+37½

Extra Strong, Plain Ends

Steel, buttweld		
½-in.	39½ to 37½	24½ to 22½
¾-in.	43½ to 41½	28½ to 26½
1-in.	45½ to 43½	31½ to 29½
1¼-in.	46 to 44	32 to 30
1½-in.	46½ to 44½	32½ to 30½
2-in.	47 to 45	33 to 32
2½ to 3-in.	47½ to 45½	33½ to 31½
Steel, lapweld		
2-in.	37	22½
2½ to 3-in.	42	27½
3½ to 6-in.	44½ to 41½	30 to 27
Steel, seamless		
2-in.	35	20½
2½ to 3-in.	38	24½
3½ to 6-in.	42½	28
Wrought Iron, buttweld		
½-in.	+22	+47
¾-in.	+15½	+40
1 to 2-in.	+ 5½	+29
Wrought Iron, lapweld		
2-in.	+10½	+33½
2½ to 4-in.	+ 1	+22
4½ to 6-in.	+ 5	+26½
7 & 8-in.	list	+21½
9 to 12-in.	+11½	+29½

For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. *Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut lengths 10 to 24 ft inclusive.

OD in in.	gage BWG	Seamless H.R.	Seamless C.R.	Electric Weld H.R.	Electric Weld C.D.
2	13	$20.61	$24.24	$19.99	$23.51
2½	12	27.71	32.58	26.88	31.60
3	12	30.82	36.27	29.90	35.18
3½	11	38.52	45.38	37.36	43.99
4	10	47.82	56.25	46.39	54.56

CAST IRON WATER PIPE

Per net ton

6 to 24-in., del'd Chicago .. $91.80 to $95.30
6 to 24-in. del'd N. Y. ... 91.00 to 92.00
6 to 24-in., Birmingham .. 78.00 to 82.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less ..... $108.50 to $113.00
Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb. (Metropolitan area delivery, add 20¢ to base price except Birmingham, Cincinnati, New Orleans, St. Paul (*), add 15¢; Philadelphia, add 25¢).

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140 Ann.
Baltimore	5.05	6.24–6.44[1]	6.46–6.46[2]	5.59–5.59[11]	....	5.20–5.64[11]	5.49	5.49–5.49[11]	6.19	9.69	9.99	11.12	11.49
Birmingham*	5.05[10]	5.80	6.15[7]	5.10[10]	....	5.20	5.05	5.00[10]	6.73	....	....	....	....
Boston	5.73	6.48[20]–6.85	6.79–7.24[21]	5.78	6.90–6.95	5.88	5.55	5.60	6.30–6.58	9.70–9.97	8.50–10.37	11.15	11.45
Buffalo	5.05	5.80	6.80	5.41	7.27	5.45	5.15	5.05	5.75	9.60	9.90	11.05	11.35
Chicago	5.05	5.80	6.70	5.10	6.80	5.20	5.05	5.00	5.65	9.25	9.55	10.70	11.00
Cincinnati*	5.32–5.97	5.80–6.24	6.29–6.39	5.49	....	5.59–5.74	5.44–5.59	5.39–5.54	6.10–6.25	9.60–9.81	9.90–10.11	11.05–11.26	11.35–11.56
Cleveland	5.05	5.80	6.95	5.24	6.35	5.32	5.17	5.12	5.75	9.36	9.66	10.81	11.11
Detroit	5.33	6.08	7.09	5.49	6.27–6.58	5.59	5.44	5.39	6.03	9.58	9.86	11.01	11.31
Houston	5.75	....	....	6.10	....	6.00	5.95	6.10	7.80	10.35–10.45	10.50–10.60	11.50	11.95–12.10
Indianapolis	....	....	....	....	7.36	....	....	....	....	....	....	....	....
Kansas City	5.65	6.40	7.30	5.70	6.95	5.80	5.65	5.60	6.35	9.85	10.15	11.30	11.60
Los Angeles*	5.80	7.00	7.50[2]	5.85	8.35[16]	5.80	5.70	5.80	7.55	10.05	10.20	11.70	12.10
Memphis	5.93	6.68	....	5.98	6.80	6.08	5.93	5.68	....	....	....	....	....
Milwaukee	5.19	5.94	6.84	5.24	6.32	5.34	5.19	5.14	5.89	9.39	9.69	10.84	11.14
New Orleans*	5.50[1]	6.85[1]	....	5.55[1]	6.90[1]	5.65	5.55[1]	5.55[1]	6.75	....	....	....	....
New York	5.55–5.65	6.54–6.64[1]	6.90–7.05[2]	5.84	6.78[5]	5.70	5.45	5.60	6.44	9.60	9.90	11.05	11.35
Norfolk	6.10	7.00	....	6.30	....	6.15	6.20	6.15	7.20	....	....	....	....
Omaha	....	....	....	....	....	....	....	....	....	....	....	....	....
Philadelphia*	5.30	6.20	6.70[2]	5.65	6.29	5.45	5.25	5.50	6.21	9.35	9.65	10.80	11.10
Pittsburgh	5.05	5.80	6.45	5.20	6.00	5.15	5.05	5.00	5.75	9.25	9.55	10.70	11.00
Portland	6.60–7.10[1]	8.40[2]	8.20[2]	6.85[9]	....	6.40[9]	6.50	6.45–6.45[9]	8.60[14]	12.00[18]	11.60[18]	....	....
Salt Lake City	5.85	6.70	8.75	7.45	8.75	6.10[3]	5.90	7.35[8]	8.75	....	....	....	....
San Francisco	6.25[11]	7.60[2]	7.50[2]	6.75[11]	7.85[16]	6.15[11]	6.00[11]	6.15[11]	7.55	10.05	10.20	11.70	12.10
Seattle	6.80[4]	8.15[2]	8.20[2]–8.35[2]	6.85[4]	....	6.35[4]	6.20[4]	6.35[4]	8.50[14]	....	11.60[18]	....	13.60[18]
St. Louis	5.38	6.13	7.05	5.43	6.68–7.54	5.53	5.38	5.33–5.35	6.08	9.58	9.88	11.03	11.33
St. Paul	5.61	6.36	7.26	5.66	6.16–6.82	5.76	5.61	5.56	6.31	9.81	10.11	11.26	11.56

BASE QUANTITIES: *(Standard unless otherwise keyed on prices.)*
Hot-rolled sheets and strip, hot rolled bars and bar shapes, structural shapes, plate, galvanized sheets and cold-rolled sheets: 2000 to 9999 lb. Cold-finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb.

All HR products may be combined to determine quantity bracket. All galvanized sheets may be combined to determine quantity bracket. CR sheets may not be combined with each other or with galv. sheets to determine quantity bracket.

Exceptions:
(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 to 5999 lb; (6) 1000 lb and over; (7) 500 to 1499 lb; (8) 400 lb and over; (9) 400 to 9999 lb; (10) 500 to 9999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 9999 lb; (16) 6000 lb and over; (17) up to 1999 lb; (18) 1000 to 4999 lb; (19) 1500 to 3499 lb; (20) CR sheets may be combined for quantity; (21) 3 to 24 bundles.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	48.50	49.00	49.50	.....
Birmingham	41.88	42.38	....	.....	.....
Buffalo	46.00	46.50	47.00	.....	.....
Chicago	46.00	46.50	46.50	47.00	.....
Cleveland	46.00	46.50	46.50	47.00	51.00
Duluth	46.00	46.50	46.50	47.00	.....
Erie	46.00	46.50	46.50	47.00	.....
Everett	....	50.50	51.00	.....	.....
Granite City	47.90	48.40	48.90	.....	.....
Ironton, Utah	46.00	46.50	....	.....	.....
Pittsburgh	46.00	46.50	46.50	47.00	.....
Geneva, Utah	46.00	46.50	....	.....	.....
Sharpsville	46.00	46.50	46.50	47.00	.....
Steelton	48.00	48.50	49.00	49.50	54.00
Struthers, Ohio	46.00	....	....	.....	.....
Swedeland	48.00	48.50	49.00	49.50	.....
Toledo	46.00	46.50	46.50	47.00	.....
Troy, N. Y.	48.00	48.50	49.00	.....	54.00
Youngstown	46.00	46.50	46.50	47.00	.....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	50.50	51.00	.....	.....
Boston	Steelton	6.90	.....	....	....	....	60.90
Brooklyn	Bethlehem	4.29	.....	52.79	53.29	53.79	.....
Cincinnati	Birmingham	6.70	48.58	49.08	....	.....	.....
Jersey City	Bethlehem	2.63	.....	51.13	51.63	52.13	.....
Los Angeles	Geneva-Ironton	7.70	53.70	54.20	....	.....	.....
Mansfield	Cleveland-Toledo	3.33	49.33	49.83	49.83	50.33	54.33
Philadelphia	Bethlehem	2.39	50.39	50.89	51.39	51.89	.....
Philadelphia	Swedeland	1.44	49.44	49.94	50.44	50.94	.....
Philadelphia	Steelton	3.09	.....	....	....	.....	57.09
Rochester	Buffalo	2.63	48.63	49.13	49.63	.....	.....
San Francisco	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Seattle	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	.....
Syracuse	Buffalo	3.58	49.58	50.08	50.58	.....	.....

Producing point prices are subject to switching charges; silicon differential (not to exceed 50c per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 38c per ton for phosphorus content of 0.70 pct and over manganese differentials, a charge not to exceed 50c per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct C/L per g.t., f.o.b. Jackson, Ohio—$57.00; f.o.b. Buffalo, $58.25. Add $1.00 per ton for each additional 0.50 pct Si up to 17 pct. Add 50c per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $60.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $68.56. High phosphorus charcoal pig iron is not being produced.

FERROALLOYS

Ferromanganese

78-82% Mn. maximum contract base price, gross ton, lump size.

F.o.b. Birmingham	$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	$172
F.o.b. Johnstown, Pa.	$174
F.o.b. Sheridan, Pa.	$172
F.o.b. Etna, Clairton, Pa.	$175

$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.45
Ton lots	12.05

Spiegeleisen

Contract prices gross ton, lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$64.00	$65.00
Pgh. or Chicago	65.00	66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Medium Carbon Manganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn ..... 18.15¢

Low-Carbon Manganese

Contract price, cents per pound Mn contained, lump size, delivered.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	25.25	27.10	28.30
0.10% max. C	24.75	26.60	27.80
0.15% max. C	24.25	26.10	27.30
0.30% max. C	23.75	25.60	26.80
0.50% max. C	23.25	25.10	26.30
0.75% max. C, 7.00% max. Si	20.25	22.10	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.90

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $77.00 gross ton, freight allowed to normal trade area; Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $73.50. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.

Carload, bulk	6.30
Ton lots	7.90

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	17.00	75% Si	13.50
50% Si	11.30	85% Si	14.65
90-95% Si			16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Prices Continued on Next Page

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max Si.)

0.06% C	28.75	0.20% C	27.75
0.10% C	28.25	0.50% C	27.50
0.15% C	28.00	1.00% C	27.25
2.00% C			27.00
65-69% Cr, 4-9% C			20.50
62-66% Cr, 4-6% C, 6-9% Si.			21.35

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.20% max. C	$1.09
0.50% max. C	1.05
9.00 min. C	1.04

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 20.50¢ per lb of contained Cr plus 11.30¢ per lb of contained Si.

Bulk 1-in. x down, 20.65¢ per lb contained Cr plus 11.50¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.25
Less ton lots	18.50

Other Ferroalloys

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.65¢
Ton lots	9.05¢
Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo	96¢
Ferrocolumbium, 50-60%, 2 in x D, contract basis, delivered, per pound contained Cb.	
Ton lots	$3.50
Less ton lots	3.55
Ferro-Tantalum-columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta	$2.67
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo	$1.13
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton	$65.00
10 tons to less carload	75.00
Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	$1.28
Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	$1.40
Less ton lots	1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton	$160.00
Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	$2.25
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.	
Openhearth	$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.	95¢
bags, f.o.b. Washington, Pa., Langeloth, Pa.	94¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk, lump	11.00¢
Ton lots, bulk, lump	11.50¢
Less ton lots, lump	12.25¢
Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2O_5	$1.20
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	6.60¢

Boron Agents

Contract prices, per lb of alloy, del.	
Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	$4.25
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b. Suspension Bridge, N. Y.; freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	8.625¢
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots	$1.20
F.o.b. Wash., Pa.; 100 lb, up	
10 to 14% B	.75
14 to 19% B	1.20
19% min. B	1.50
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.	
Ton lots	$1.67
Less ton lots	1.79
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	$1.80
Silcaz, contract basis, delivered.	
Ton lots	45.00¢

FREE

PUBLICATIONS

Continued from Page 36

a new 4-p. illustrated folder. *Delaware Tool Steel Corp. For more information, check No.* 12 *on the postcard on p.* 37.

Radioisotopes

Detailed information on all Tracerlab products, designed for every application of radioisotopes in research, industry, medicine, agriculture and other fields, is given in a new 90-p. catalog. *Tracerlab Inc. For more information, check No.* 13 *on the postcard on p.* 37.

Precision Casting

Many applications of precision castings, specifications, and a step-by-step explanation of the Microcast Process are presented in a new 16-p. booklet. *Microcast Div., Austenal Laboratories, Inc. For more information, check No.* 14 *on the postcard on p.* 37.

Profile Dresser

The many features of the Duplicform tool and die dresser and profile grinder are described in a new 8-p. catalog. *Airborne Accessories Corp. For more information, check No.* 15 *on the postcard on p.* 37.

Fluorescent Lights

Holdenline Arrowhead engineered lighting units, in a variety of styles and sizes, are described and illustrated in an 8-p. bulletin. *Holdenline Co. For more information, check No.* 16 *on the postcard on p.* 37.

Colloidal Graphite

Advantages and applications for Dag colloidal graphite in a number of foundry operations are presented in a new 6-p. folder illustrating uses. *Acheson Colloids Corp. For more information, check No.* 17 *on the postcard on p.* 37.

Couplings and Clutches

The line of Dynamatic variable speed couplings and clutches, dynamometers, electric slip brakes, and

Ajusto-Spede AC motors are described in two new 4-p. bulletins. *Eaton Mfg. Co. For more information, check No.* 18 *on the postcard on p.* 37.

Vibratory Feeders

The line of Syntron Vibra-Flow vibratory feeders, long conveyors, multiple magnet models, furnace feeders and infra-red dry feeders are described in a new 16-p. catalog. *Syntron Co. For more information, check No.* 19 *on the postcard on p.* 37.

Electric Heat

Examples of some of the hundreds of Electric Heat installations in the Cleveland-Northwest Ohio area are presented in a 12-p. booklet listing the advantages of this type of heat. *Cleveland Electric Illuminating Co. For more information, check No.* 20 *on the postcard on p.* 37.

Stitchers and Staplers

Some of the hundreds of Bostich machines for such shipping room applications as top sealing, assembling, bottoming, bag sealing and tacking are described in a 6-p. illustrated folder. *Bostich Co. For more information, check No.* 21 *on the postcard on p.* 37.

Carbide Tools

Available sizes, prices, recommended applications, feeds and speeds, and grinding instructions for the complete line of Super carbide tipped and solid carbide tools are presented in a new 64-p. catalog. *Super Tool Co. For more information, check No.* 22 *on the postcard on p.* 37.

Light Hangers

Lights can be placed at locations previously considered impractical from a maintenance standpoint, with Thompson disconnecting and lowering light hangers, as described in a 4-p. folder and data sheets. *Thompson Electric Co. For more information, check No.* 23 *on the postcard on p.* 37.

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NEW PRODUCTION IDEAS

Continued from Page 40

set of segments will check up to 100,000 parts, it is reported. A new attachment checks face run-out in relation to the thread axis. Other features include universal work holder for internal parts and adaptability to check additional surfaces in relation to the thread. *Bryant Chucking Grinder Co. For more information, check No. 38 on the postcard on p. 37.*

Fork Lift Trucks

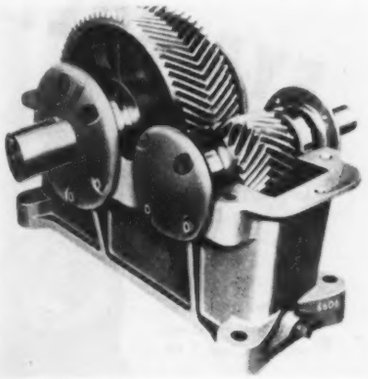
The Motowlift line of fork trucks now includes heavy-duty models of advance design in the 4000 and 6000 lb capacity class. The power plant is a Ford six cylinder industrial engine of 226 cu in. displacement. Component parts are said

to be larger and stronger than customary. In addition to a single lever control for lifting and tilting operations, a further driving feature is a single lever automotive type gear shift. Mast channels are formed from ¾ in. extra strength steel and lifting chains have a strength of 24,000 lb each. A variety of lifting heights is available. Instruments and gages are grouped beneath the steering wheel for easy visibility. *Service Caster & Truck Corp. For more information, check No. 39 on the postcard on p. 37.*

Speed Reducers

The new IMO-De Laval herringbone gear speed reducers are available in single, triple, and double reduction units of ½ to 1000 hp,

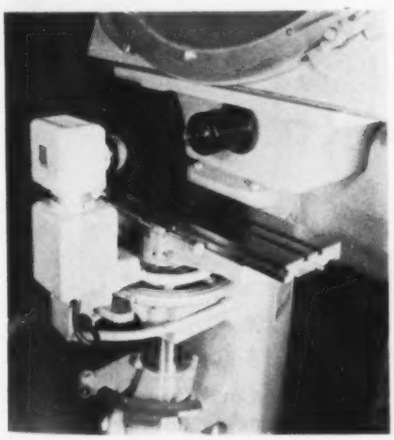
with center distances from 4 to 36 in. All shafts turn on high capacity anti-friction bearings. Output bearings of standard torque units are designed to carry medium



overhung loads. The gears are made of electric steel castings or high carbon steel forgings. *De Laval Steam Turbine Co. For more information, check No. 40 on the postcard on p. 37.*

Illuminating Unit

Increased screen illumination at high magnifications is provided by a high intensity illuminating unit now supplied on Jones & Lamson optical comparators. Shadow outlines are made sharper than before and improved contrast, highly

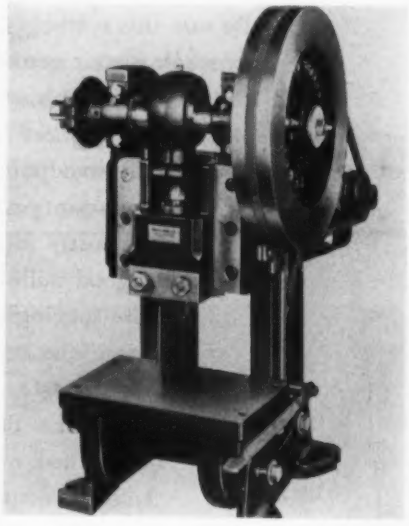


accurate readings can be obtained with less effort and with increased eye comfort. The upper portion of the unit carries a 10 v bulb, a condensing lens and a colored filter. The lower box section houses a small centrifugal-type electrically driven blower. The cooling unit operates when the lamp switch is

turned on and draws a constant stream of air through the meshed port at the top of the lamp house. The entire lamp assembly is held at a constant normal temperature. *Jones & Lamson Machine Co. For more information, check No. 41 on the postcard on p. 37.*

Punch Press

Features of a new 4-ton open-back, inclinable punch press include a 7x10 in. bolster plate permitting use of standard die sets; large, hardened and ground, adjustable V-type ram guides on each side of the frame; over-sized ram

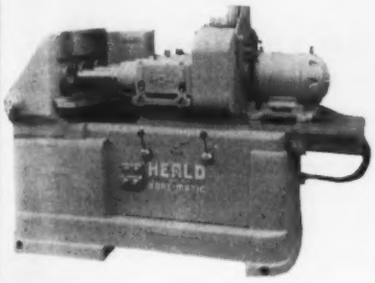


area; extra heavy-duty ram, designed for greater setup ease; and one-piece, ground crankshaft with extra heavy connecting rod. The press has a positive single trip mechanism, adjustable for wear, and instantly convertible from single trip to repeat and back without stopping the motor. A full-sized, adjustable brake is standard equipment. Total weight, less motor, is 250 lb. *Kenco Mfg. Co. For more information, check No. 42 on the postcard on p. 37.*

Boring Machine

Two new end loading Bore-Matics, Models 425 and 426, differ from other Heald end loading models in that fixture and work are mounted on the bridge while the

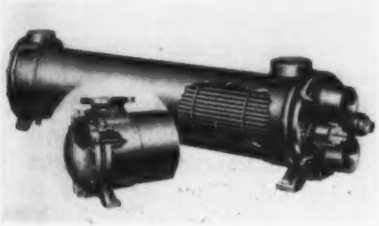
boringheads and motors are located on the machine table. Model 425, illustrated, is arranged with a stationary fixture; model 426 is similar but has an indexing cross slide on the bridge that allows three work-



pieces to be loaded while three others are being bored. *Heald Machine Co. For more information, check No. 43 on the postcard on p. 37.*

Copper Exchangers

A new line of standardized exchangers, featuring all-cuprous, removable tube bundle construction, is available in a broad range of sizes. Originally designed for service on Navy combat vessels, the Type BCP not only has been



adapted to low-cost, quantity production, but now embodies larger transfer surface. A smaller unit serves the same conditions that formerly required larger sizes. *Ross Heater & Mfg. Co., Inc. For more information, check No. 44 on the postcard on p. 37.*

Payloader

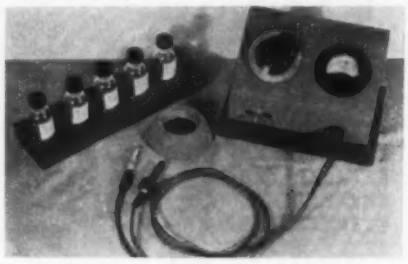
With ½ yd bucket capacity, a new payloader tractor shovel handles bulk materials inside and outside at industrial plants. It will lift, lower, push and haul. The Model HE is a complete Hough-built tractor-with-shovel, designed for tractor shovel work. It has full

reversing transmission with four forward and four faster reverse speeds coupled with forward-reverse control separate from the regular gear shift, assuring speedy shifting into reverse and speed in

reverse. Ball bearing steering, hydraulic brakes, comfortable operator seating and operator location for full visibility of operations are other features. Full dumping clearance is 91 in. *Frank G. Hough Co. For more information, check No.* 45 *on the postcard on p.* 37.

Metal Identification

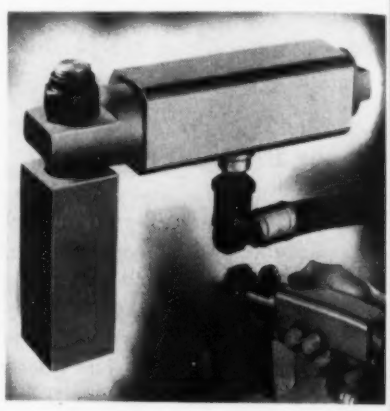
A portable metal and alloy identification instrument known as Electrospot utilizes the inherent differences in the surface films on



metals and alloys to effect separation by electrolytic means. Identification of small items is accomplished by dipping a portion of the material in an electrolyte and for large items by pressing a test probe against the material. Reading a dial setting after rotation to a zero deflection on a millivolt meter identifies the alloy. For rapid sorting, a predetermined dial setting is used, and an immediate deflection of the meter pointer to the right or left identifies the material. Electrospot identifies and sorts materials regardless of shape or form and is rated at 1000 pieces per hr. *Electrochemical Instrument Laboratory. For more information, check No.* 46 *on the postcard on p.* 37.

Air Vibrators

Versatility of use and portability are features of the new SAH pneumatic vibrator assembly. Vibrators incorporate an alloy steel stud that facilitates rapid, easy insertion into the sleeve type mounting bracket that is welded to the assembly requiring vibration. Designed for continuous operation, air vibrators can be furnished in 1¼ in. size that



delivers 2500 hammer-like vibrations per min on 100-lb line pressure, and the 2-in. size unit that delivers 1250 blows per min on the same pressure. Vibrators operate on line pressures ranging from 50 to 100 psi. *Cleveland Vibrator Co. For more information, check No.* 47 *on the postcard on p.* 37.

Multi-Tapper

For multiple tapping and drilling in mass production lines, a new multi-tapper features a silent roller chain to transmit power from the Torqomatic drive unit. The chain withstands constant friction and can absorb the shock loads due to continuous forward and reverse action. Less wear of gears, quiet operation and increased production at lower cost is claimed by the manufacturer. Number of spindles is limited only by size of tap or drill and the work. *Charles L. Jarvis Co. For more information, check No.* 48 *on the postcard on p.* 37.

High Purity Chemical

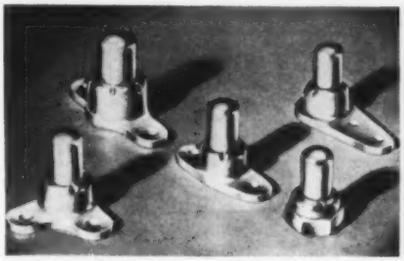
Greater accuracy in analytical determinations by oxidation-reduction methods are assured by use of a new higher purity chemical, Ferrous Ammonium Sulfate. The reagent is said to contain copper, zinc, manganese and phosphates in negligible amounts; ferric iron, 0.005 pct; insoluble materials 0.01 pct. It is made from Swedish carbon steel low in alloying elements, and by processes said to assure highest purification. *Fisher Scientific Co. For more information, check No.* 49 *on the postcard on p.* 37.

Bench Blast Cabinet

Designed for the abrasive blast cleaning of small parts such as automobile pistons, dies, tools, and castings, a portable bench blast cabinet operates on compressed air supplied by a standard 5 hp, 2-stage compressor. The operator loads the parts through the top hinged cover and observes the work through the window in the cover. Operator's hands in rubber gloves rotate the work in the blast stream. A ventilating fan draws off the dust and a side-mounted light provides efficient vision during the blasting. *W. W. Sly Mfg. Co. For more information, check No.* 50 *on the postcard on p.* 37.

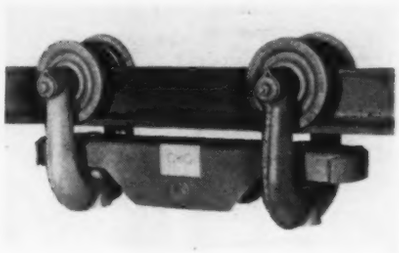
Self-Locking Cap Nuts

New ESNA self-locking high cap nuts offer flexibility for production line use because of the depth of screw-thread penetration that the extra height permits. The ESNA red elastic collar and the new cap form a pressure seal against external or internal liquid and gas pressures of 80 psi minimum, without leakage. These K3 cap nuts insure full clearance for An-3 and An-4 bolts or An-509 screws. *Elastic Stop Nut Corp. For further information, check No.* 51 *on the postcard on p.* 37.



Tramrail Trolley

Reduced operator fatigue and increased payloads are claimed for an improved Ohio Tramrail trolley. Drawbar pull on the heavier capacity trolleys after normal break-in period is said to be reduced to 15 lb per ton to start the load rolling and 10 lb per ton to maintain momentum. Safety factors enable the trolleys to take shock loads considerably higher than their rated capacity. The trolley yoke swivels freely on a rolled steel kingpin to eliminate binding of wheel flanges on curves and switches of short radii. Friction losses are reduced to a minimum through use of chilled cast iron wheels of 4½ in. tread diam rolling on hi-carbon hi-manganese steel rail. The basic trolley is a four-wheel unit with a 16-in. wheelbase. *Forker Corp. For more information, check No.* 52 *on the postcard on p.* 37.



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February Finished Steel Shipments

As Reported to the American Iron & Steel Institute

STEEL PRODUCTS	Line No.	February Carbon	February Alloy	February Stainless	February Total	February Percent of Total Ship. Month	To Date This Year Carbon	To Date This Year Alloy	To Date This Year Stainless	To Date This Year Total	To Date This Year Percent of Total Ship. Month
Ingots	1A	33,826	9,632	1,450	44,908	0.9	83,933	18,192	2,322	84,447	0.8
Blooms, slabs, billets, tube rounds, sheet bars, etc.	1B	144,839	29,912	404	175,235	3.4	299,518	62,987	1,359	363,864	3.4
Skelp	2	7,419	-	-	7,419	0.1	20,745	-	-	20,745	0.2
Wire rods	3	58,380	1,218	143	59,741	1.2	129,626	2,346	220	132,188	1.3
Structural shapes (heavy)	4	305,226	3,303	2	308,531	6.0	626,845	7,011	2	633,858	6.0
Steel piling	5	17,141	-	-	17,141	0.3	34,736	-	-	34,736	0.3
Plates	6	335,434	10,176	769	346,379	6.7	779,703	21,207	1,509	802,419	7.6
Rails—Standard (over 60 lbs.)	7	115,586	6	-	115,594	2.3	257,331	8	-	257,339	2.4
Rails—All other	8	8,936	27	-	8,963	0.2	17,996	53	-	18,049	0.2
Joint bars	9	8,648	-	-	8,648	0.2	16,572	-	-	16,572	0.2
Tie plates	10	27,330	-	-	27,330	0.5	53,235	-	-	53,235	0.5
Track spikes	11	10,417	-	-	10,417	0.2	18,360	-	-	18,360	0.2
Wheels (rolled & forged)	12	16,455	7	-	16,462	0.3	33,027	15	-	33,042	0.3
Axles	13	4,106	92	-	4,198	0.1	8,596	148	-	8,744	0.1
Bars—Hot rolled (incl. light shapes)	14	456,006	143,826	1,881	601,713	11.7	919,586	298,140	3,831	1,221,557	11.5
Bars—Reinforcing	15	100,851	-	-	100,851	2.0	222,583	-	-	222,583	2.1
Bars—Cold finished	16	97,057	16,003	1,850	114,910	2.2	188,583	34,240	3,607	226,430	2.1
Bars—Tool Steel	17	1,333	4,597	-	5,930	0.1	2,466	9,307	-	11,773	0.1
Standard pipe	18	180,131	-	-	180,131	3.5	336,728	-	3	336,731	3.2
Oil country goods	19	110,461	15,473	-	125,934	2.5	225,373	32,300	-	257,673	2.4
Line pipe	20	260,170	-	-	260,170	5.1	525,879	-	-	525,879	5.0
Mechanical tubing	21	32,164	14,040	194	46,398	0.9	66,908	26,554	454	93,916	0.9
Pressure tubing	22	17,710	1,825	571	20,106	0.4	33,948	4,553	1,112	39,613	0.4
Wire—Drawn	23	215,235	2,978	1,873	219,886	4.3	441,311	5,493	3,000	449,804	4.2
Wire—Nails & staples	24	70,650	4	21	70,675	1.4	141,921	4	26	141,951	1.3
Wire—Barbed & twisted	25	18,381	-	-	18,381	0.4	34,260	-	-	34,260	0.3
Wire—Woven wire fence	26	36,116	-	-	36,116	0.7	68,309	-	-	68,309	0.6
Wire—Bale ties	27	3,102	-	-	3,102	0.1	5,529	-	-	5,529	0.1
Black plate	28	40,787	-	-	40,787	0.8	77,636	-	-	77,636	0.7
Tin & terne plate—hot dipped	29	142,803	-	-	142,803	2.8	285,591	-	-	285,591	2.7
Tin plate—Electrolytic	30	185,892	-	-	185,892	3.6	391,432	-	-	391,432	3.7
Sheets—Hot rolled	31	553,865	17,130	2,304	573,299	11.2	1,118,790	• 32,143	4,486	•1,155,413	10.9
Sheets—Cold rolled	32	657,422	6,425	7,491	671,338	13.1	1,354,330	13,554	15,259	1,383,151	13.0
Sheets—Galvanized	33	171,844	1,513	-	173,357	3.4	365,829	3,542	-	369,371	3.5
Sheets—All other coated	34	17,998	-	-	17,998	0.3	33,146	-	-	33,146	0.3
Sheets—Enameling	35	17,765	-	-	17,765	0.3	33,899	-	-	33,899	0.3
Electrical sheets & strip	36	6,936	41,400	-	48,336	0.9	13,594	• 85,488	-	• 99,082	0.9
Strip—Hot rolled	37	162,508	3,733	695	166,896	3.2	334,559	7,705	969	343,324	3.2
Strip—Cold rolled	38	128,258	808	12,014	141,080	2.7	254,441	1,844	25,557	281,842	2.7
TOTAL		4,779,148	324,130	31,502	5,134,780	100.0	9,886,856	666,915	63,700	10,617,471	100.0

During 1948 the companies included above represented 99.4% of the total output of finished rolled steel products as reported to the American Iron and Steel Institute.

Columbia Gets New Mill

San Francisco—A single stand, two-high temper mill and auxiliary flattening facilities are being installed in the sheet and tin mill of Columbia Steel Co. at Pittsburg, Calif. These new facilities for flattening hot rolled sheets received from the Geneva steel plant in Utah are expected to be in operation within the next three months.

Columbia Steel Co. plants set an all-time record for monthly shipments in March when 62,947 net tons of products were moved. Best previous month was January 1949 when the company shipped 62,519 net tons of steel.

The Pittsburg, Calif., plant set operating and shipping records during March which included 30,444 net tons of steel ingots produced and 16,519 net tons of steel sheet shipped. Best previous month of ingot production was in March 1948 when 29,536 net tons of ingots were produced and the best previous month for shipment of steel sheet was January 1950 when 10,981 net tons were shipped.

Engineering Building to Open

Urbana, Ill.—A new mechanical engineering building will be dedicated by the University of Illinois during a 2-day program on May 12-13. Included will be technical sessions of the Midwest Conference on Fluid Dynamics and a meeting of the American Physical Soc., Fluid Dynamics Div.

Swedish Ore Exports Reach Peak

Washington—Swedish iron-ore exports in 1949 reached a postwar peak of 12,784,000 metric tons compared with 11,518,000 tons in 1948, according to the U. S. Department of Commerce.

Spare Parts Contracts Awarded

Washington—Government automotive spare parts contracts totaling almost $2.5 million were awarded recently to Chrysler Corp., $102,145, and to the Firestone Industrial Production Co., $2,356,200.

THE CLEARING HOUSE

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Shorter depreciation periods favored in Cleveland area

Material handling units have fair activity in Pittsburgh

Machinery sales show upward trend in Detroit area

Ohio Machinery Dealers Favor Shorter Depreciation

Cleveland—Dealers in Cleveland and adjacent areas have definite opinions on the merits of shorter depreciation periods for capital equipment. In addition to allowing plants to write off and replace machines at a faster rate, and thus remain competitive, these dealers feel that the used machinery released will be of a later vintage and will eventually level off at more realistic prices. This will allow many of the medium and smaller sized plants to economically install these later type machines in their production lines.

These dealers also have definite ideas as to what the proposed periods should be. Most feel that periods of from 5 to 7 years on production tools and 15 to 20 years on toolroom items would be to the advantage of the manufacturing firms, the machine tool builders, and the used machinery dealers.

Material Handling Items Have Fair Demand in Pittsburgh Area

Pittsburgh—Dealers report that demand for material handling items is mixed in the Pittsburgh area. Spotty activity has been experienced in the fork truck lines. Demand is only fair for used cranes. Buyers are unwilling to pay what was formerly considered a reasonable price. There are few really good cranes available. A dealer here reported that the asking prices for them are pretty fancy. He mentioned specifically the asking prices of a west coast shipbuilding plant. While inquiries are still good, few of them materialize, and many of them are for hard-to-locate equipment.

Prospective buyers are independent about buying equipment on which they would have to make changes. For example, it's just about impossible to persuade a prospect to buy a crane with cab controls when he's looking for ground control equipment. He's unwilling to make the necessary changes himself. Inquiries for new cranes are slow.

Foreign business is chiefly with Latin American countries and Canada. A recent inquiry for four cranes and six hoists was received from a Cuban structural steel shop.

Increased Sales Activity Enjoyed by Detroit Dealers

Detroit — With few exceptions, most suppliers of used machinery in the Detroit area have experienced an upward trend in sales during the past month. Some sources are reporting a gain as high as 50 pct although the average is somewhat less than this.

Leading the fast moving items at the moment are broaches, milling machines and production drilling equipment. The demand for presses, particularly presses with large beds, has quickened appreciably for a number of suppliers, the trade reports. Slowest moving categories appear to be lathes and similar production and tool room items.

While most of the buying is originating with large firms in

Turn to Page 172

AARON FOR RELIABILITY

AUTOMATICS
Brown & Sharpe #00G, H.S. #4 & 6
Brown & Sharpe #2G, 1½" cap.
Cammatic 8 sp. 1⅞" cap.
New Britain Gridley 6I—2¼" 6 sp.
Cone ⅝" Swiss type

BORING MILLS
Giddings & Lewis #0, #25T
Lucas #3I horiz.
Universal 3" horiz. equipped
Bullard 42" V.T.L.

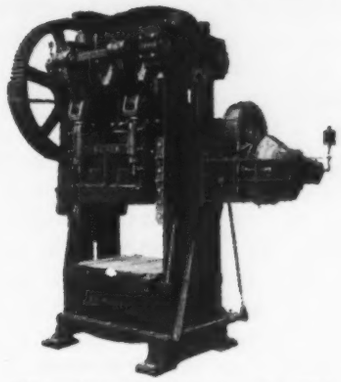
DRILLS AND RADIALS
Allen 6 spindle
Cincl-Bickford Sup. Ser. 21"
Royersford Excelsior 21"
Cundy-Otto 3'-9" sel.
Carlton 8'-19" sel.
Sibley 24" & 28"

ENGRAVERS
Gorton #3U, 2 dimensional
Gorton Cutter Grinders 375-2, 265-6
Deckel GKI 3 Dimensional

GEAR EQUIPMENT
Barber-Colman #3 Hobbers (3)
Gleason 3" Generator
Hamilton Hobber
Fellows 648Y, #7, #72, #725 High Speed Shapers
Mikron Gear Hobber
Fellows, Michigan, Gleason Checkers

GRINDERS, MISCELLANEOUS
Brown & Sharpe #5 cyl., 3" x 18"
Brown & Sharpe #1, #2, #3 Univ. #13 Tool
Cincinnati #2 Centerless Filmatic, 12 x 36 Univ.
Cincinnati #2 Tool & Cutter, univ.
Cinn. 12 x 48" Univ., Gardner #226, 30" disc.
Covel #91A Univ. Tool & Cutter, Hammond #4
Heald 72A3 Int. Centerless Sizematic, #1 Tool
J. & L. TG638 Thread Grinder
Landis #4H Cyl. 4x12", Centerless, #6 Thread
Norton #2 Tool & Cutter, Type C, 6x30"
Oliver #510 Drill Pointer, Sellers 4G, Black D'mond
Pratt & Whitney Radius #R6, K.O. Lee Tool
Porter Cable Belt WG8, G8; Grenby Int.

GRINDERS, SURFACE
Abrasive #3B, 6x24", #33, #34 Vert.
Blanchard #16, 30" Mag. Chuck, #11—16" chuck
Brown & Sharpe #2
G. & L. #25, #35 Hyd. Feed, 6 x 18, 8 x 24



Bliss 406-48" Dbl. Crank, Dbl. Action Toggle Press

Hanchett 300 series, 13x48" with chuck, Hammond #2
Norton 6x18" Hyd., Atlantic 6x18" Power Feed
Reid #2A P.F. MIB., #2C Pope Spdl.
Pratt & Whitney 12x36" Vert.
Thompson Hyd. 6x10x18", 6x12x18"

LATHES
Hardinge Precision 9", 1" Collet Cap., Rivett
Headey G.H., 16x30", Rel. Att. Bradford 14"x9'
LeBlond Regal 15x30", 21x60", 10"x3½', 19x48"
LeBlond Heavy Duty 16x33"
Lodge & Shipley 16x78" T.A., Collets, etc.
Monarch 10"x20" EE, 16x78 G.H., 12x30"
Sebastian 12"x4' G.H.
Sheldon 11"x24", Logan 10"x30"
South Bend 13x36", 14½"x6', 10x4, 9x3, 9x3½

MILLS, PLAIN, UNIVERSAL & PROD.
Brown & Sharpe #000, 12, 21, #2A Univ., 2B PL.
Burke #4 Plain & Univ. Vert. Hd.
Cincinnati 2MH Univ.—1-12, 1-18, 2-18 Mfg.
Kent Owens #1V; U.S. Hand Mills
Milwaukee #2HL, 2H Univ., 2H Plain
U. S. Multimiller
Sundstrand 00 Rigidmill; Whitney Hand Mills
Van Norman #12, 22L, 36; U. S. 1 & 2 sp.

MILLS, VERTICAL
Bridgeport Vert. Slotter, Hor. Sp.
Brown & Sharpe #2
Cincinnati #4
Fosdick Jig Borer #42A, HD. Equipped
Gorton #8D, 9J Plain, 8½D Duplicator
Sip Jig Borer #MP-5
Index, Jackson, Vernon
Milwaukee 3H, H.S.D.T.
Morey #12M Profiler 2 sp., P. & W. 12B

PRESSES
Bliss 675, 650, 645B Hi-Production Presses
Bliss #8 Dbl. Crank, Bed 42"x96"
Bliss 19, 20, 21 OBI, 58, 62, 62A, 102 OB.
Bliss #4½ Double Action, Roll Feeds

HYDRAULIC EQUIPMENT

Cap.	Manufacturer	Platen	Stroke	Opening
550	Southwark	42x32"	28"	60"
500 Ton	Lake Erie	35x36"	36"	60"
600	Bald.S'thw'k	76x59"	24"	60"
500 D.A.	H.P.M. (150 Cushion)	36x36"	24"	60"
300	Brand New Watson Stillman Hobbing Press			
50	Dennison	22x20	18	23
150	Southwark	84x30	30	2' to 4'

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500 Ton Shaft Straighteners—Self Contained

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Toledo 400 Ton Knuckle Joint
V. & O. #102 O.B.I. Reducing

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Acme #6W Bar & Chuck, Acme 8W Fox, 4W
Bardons & Oliver #3, 1½" cap., #5, 2" cap.
Brown & Sharpe #1, 2F, Hand
Gisholt #4, 5 Bar & Chuck, 1L, Foster #3B
Hardinge ESM Second Operation
J. & L. 8A—Well Tooled
Oster #601 Rapiduction, well tooled
Warner & Swasey #5, 4, 3, Universal
Warner & Swasey #4A, 8" cap. Power Chucks (2)

MISCELLANEOUS
Band Saw; Tannewitz #36M, DoAll ML, Vis
Bending Roll; Buffalo #0, ½WR, Excelsior #14
Broach; American Horiz. Hyd. Model H-15-60
Hacksaw; Marvel 6A Automatic #6
Hardness Tester; Clark
Hones; Micromatic #H-1, Sunnen
Keyseater; Davis, Baker, M & M
Riveters; HI Speed
Router; Onsrud #W240, 55
Saws; Wells, Catskill, Peerless, Kalamazoo
Slotter; P. & W. 6" Vert. Shaper
Shaper; 8" Shaperite, 7" Atlas
Shear; Pexto 6'x14 Ga.
Tappers; Bakewell #1, Haskins #2C, 3C
Welders; Seam & Spot; Thompson, Taylor-Winfield, Sciaky

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Shear, Rotary Guiskwerk ¾" Cap. 48" Thr.
MILTON EQUIPMENT COMPANY
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Continued from Page 168

this area there has been some purchasing by smaller firms who have apparently taken advantage of the present opportunity to modernize their equipment.

An indication of the firmness of the present market is the rise in prices that has taken place in the face of the paralysis resulting directly or indirectly from the Chrysler strike. Important segments of the Detroit economy have already been seriously hit by the Chrysler stoppage this trade reports. The effects of the strike are expected to persist for several months at least as far as Chrysler suppliers are concerned.

Reorganized NISA Chapter Meets

Nashville, Tenn.—The former Tennessee chapter of the National Industrial Service Assn., now called the Mid-South chapter, held its first meeting under its new name on Mar. 18 in Nashville. In addition to Tennessee, its territory has been enlarged to include Mississippi, Alabama, and Greater Little Rock. R. E. Ward, NISA president; Charles Covington, Frank Willey, and Selden High were present to hear J. Arthur Turner report on the progress of the staff engineer's work.

Price Book Ready for Printer

The new MDNA Price-Serial Book now ready for the printer will be available in two sections, and distributed at the coming MDNA convention. Information supplied directly by equipment manufacturers will be shown in the first section, while data compiled from outside sources will be shown in the section volume.

Machinery Rebuilding Service

Facilities of one of the country's largest machinery rebuilders are described in 4-p. illustrated folder. Also included is a partial stock listing. *Motch & Merryweather Machinery Co. For more information, check No.* C1 *on the postcard on p.* 37.

Resume Your Reading on Page 169